BY ORDER OF THE
375TH MEDICAL GROUP COMMANDER

SGSC OPERATING INSTRUCTION 160-021

29 Jul 01

Medical Services

PATHOLOGY FLIGHT GUIDE TO SERVICES

The purpose of this operating instruction is to create a useful tool that defines the policy of the Pathology Flight in regards to the services it provides.

SUMMARY OF CHANGES: This operating instruction replaces MDG Pamphlet 44-115 in order to simplify the process of making timely and critical updates to this document. This will ensure health care providers and their staff have the most recent information available. Specific updates include the following: updated all alert and reference ranges; modified the section test lists to display the current procedures which are performed; updated attachment to show the current organizational chart.

1. PRINCIPLE: All clinics and wards need to have knowledge of the scope of care provided by the Pathology Flight. The information compiled in this instruction will provide them with the necessary tools to properly collect and transport specimens, as well as assist them in the interpretation of laboratory tests.

2. PERSONNEL REQUIREMENTS: All Pathology Flight personnel collecting, accessioning, and analyzing specimens, must read this operating instruction. They should be aware of the references contained, which will allow them to properly communicate the information if questioned by clinic and ward personnel.

Replaces: MGP 44-115, 1 Feb 99 **Certified by: Lt Col Holmes**
OPR: SGSC **Pages:** 98**/Distribution: General**

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INTRODUCTION

This guide outlines the general policies of the Pathology Flight to include the Anatomic Pathology and Clinical Laboratory Elements. Familiarization with the information and compliance with instructions stated herein will minimize inconvenience to patients and staff, assure professional and legal thoroughness, and will facilitate expedient performance and reporting of tests and procedures.

Though our primary mission is war readiness , this does not lessen our concern, in providing the most effective means of patient care possible. Our common objective in this area is to provide service unsurpassed by a facility of our size and capabilities. To do this, we will work together as a team.

The simplest of errors have the potential to cause problems of immense magnitude. By following the information outlined in this laboratory guide you will be doing your part in helping us to alleviate, as much as possible, the potential for error. We are all team members working toward the same goals; that is, to provide the best possible service we are capable of and to be the best medical facility in the Air Force.

Recommendations for the improvement of services are solicited and welcomed. The laboratory staff, including pathologists, are available to discuss any test performed in the laboratory. The pathologists are also available for consultations and for discussions regarding reference laboratory testing. Comments and suggestions for inclusion in future editions may be addressed to the Clinical Laboratory Flight, 375th Medical Support Squadron/SGSC, 310 W. Losey Street, Scott AFB IL, 62225-5252, 618-256-7465.

1. MISSION:

Our mission is to provide appropriate laboratory diagnostic services in a timely, accurate, and cost effective manner while providing well trained and competent deployable personnel in support of peacetime and wartime readiness.

2. OBJECTIVES:

2.1. Reduce laboratory operational costs through regional initiatives--**Supports MDG goal 2**.

2.2. Improve the technical skills of our people--**Supports MDG goal 5 and 6**.

2.3. Maintain wartime readiness skills --**Supports MDG goals 1 & 5**.

2.4. Maintain regulatory compliance, continually improve service quality and customer satisfaction--**Supports MDG goals 2 & 4.**

2.5. Exploit New Technology--**Supports MDG goal 2**.

2.6. Ensure blood donor personnel are trained to support contingency plans--**Supports MDG goals 1 & 5.**

2.7. Foster a work environment based on teamwork and mutual respect--**Supports MDG goal 6**.

2.8. Promote people programs focusing on recognition of merit and achievement--**Supports MDG goal 6.**

2.9. Provide technical expertise and support to base-wide prevention programs--**Supports MDG goal 3.**

2.10. Provide quality preceptor training and intstruction to Phase II Laboratory Students—**Supports MDG goal 5.**

3. LABORATORY ACCREDITATION:

The Pathology Flight is inspected by the College of American Pathologists (CAP) as required by AFI 44-102. Our CAP certification number is CAP 19077-01. In addition, our Blood Bank is licensed and registered (Lic# 610-004 and Reg.# 1477550) by the Food and Drug Administration (FDA) and accredited by the American Association of Blood Banks (AABB)(AABB Institutional Member #6884). The Education Programs are accredited through the Committee on Allied Health Education and Accreditation (CAHEA) for National Accrediting Agency for Clinical Laboratory Science (NAACLS). Our Clinical Laboratory Improvement Program number is DOD6222501. Documentation of the above licensure, registration, accreditation and certification are available from the OIC, Pathology Flight Quality Services upon request (DSN 576-7468).

4. LABORATORY EDUCATION PROGRAMS:

The education program provides the motivation for excellence in patient care and establishes a dynamic learning environment for individuals in the laboratory. There is currently one formal education program in operation and provides for daily structured lectures, as well as practical performance in the working area. This program is the Phase II, Medical Laboratory Apprentice Course. Classes of 7-12 students participate in a 36-week program, at the Associate of Arts degree level, and upon successful completion of phase I and phase II, can receive thirty-nine semester hours from Midwestern State University, Wichita Falls, Texas.

In addition to the Phase II program, we conduct several informal programs including:

4.1. Continuing education for all permanent staff provided with the use of audio-visual packets, in-service lectures/demonstrations and external workshops, seminars and scientific meetings.

4.2. Phlebotomy training provided to incoming personnel from other sections of the hospital, who are required to draw blood specimens in their sections, including 4NO trainees and nurses. This training is by appointment. Contact Client Services at x7275 to schedule.

4.3. Individuals from sections other than the laboratory are welcome to use any of the learning packets and audio-visual aids in the laboratory.

5. LABORATORY UPDATE:

To supplement the information provided in this guide, a Laboratory Update is published on the hospital LAN at periodic intervals.

6. POINT OF CARE TESTING:

Guidelines for conducting point of care testing to include waived, moderately complex and provider performed microscopy procedures, can be found in MDGI 44-139, Point of Care Testing Program.

7. ORGANIZATION:

The chain of command and organization of the Clinical Laboratory Flight is depicted in the organizational chart attachment.

CHAPTER 1: GENERAL

1. GENERAL LABORATORY INFORMATION:

The Pathology Flight is located on the first floor of the hospital. Current test methods, including performance specifications are available to the medical staff upon request.

2. HOURS OF OPERATION:

Normal hours of operation are 0730 to 1630 hours, Monday through Friday, excluding holidays. Routine and unusual requests are best handled during normal duty hours. Limited staff is available at other times.

Night/weekend/holiday Staffing: At least one laboratory technician is on duty from 1500-2300 and 2300-0700, 7 days/week.

3. REQUEST CATEGORIES:

3.1 Clinical Laboratory: Three types of clinical laboratory requests are recognized and will be processed accordingly: STAT, ASAP and Routine. STAT is defined as an emergency request and every effort will be made to have results back to the provider within one hour of receipt. ASAP means as soon as possible and in most instances will be performed as soon as STAT samples are completed; usually within two hours of receipt. Most routine clinical laboratory tests done in-house have results in CHCS within 4 hours but some may require 12-18 hours after specimen arrival.

3.2 Anatomic Pathology: Anatomic pathology requests are Intraoperative Consultation, Rush, and Routine. Intraoperative Consults: All other activity is suspended pending completion of the requested service. Rush: Procedure goes ahead of all routine requests. Requests for "patient waiting", "need results by xxxx hrs," etc. are in this category. Telephone report within 24 hours i.e., received prior to 1600 hours. Surgical pathology strives to complete most tissue studies within 48 hours.

4. STAT PROCEDURE LISTINGS:

Performed at ANY TIME. See the following list of procedures that are available for STAT ordering. Emergency procedures are performed in the order in which the requests are received, with the exception of transfusion requests, which are processed first. Contact a Pathologist or laboratory officer if STAT processing is required for any test not listed below.

4.1. BLOOD BANK:

4.1.1. Crossmatch

4.1.2. Type and Screen

4.1.3. Transfusion Reaction Investigation: At any time a reaction is suspected, STOP THE TRANSFUSION IMMEDIATELY, KEEP ACCESS OPEN USING 0.9% "NORMAL" SALINE. CALL LABORATORY IMMEDIATELY! Refer to MDGI 44-104, Blood Services or Chapter 4, paragraph 1.9. for further information.

4.1.4. Direct Antiglobulin Test

4.2. CHEMISTRY:

4.2.1. Amylase(serum)

4.2.2. Alcohol, medical

4.2.3. Glucose(plasma, serum or CSF)

4.2.4. Urea Nitrogen

4.2.5. Bilirubin

4.2.6. Calcium(serum)

4.2.7. Phosphorus

4.2.8. Electrolytes (Na, K, Cl, CO2)

4.2.9. Protein(CSF)-Note: CSF Protein may require reagent preparation of up to one hour.

4.2.10. Magnesium

4.2.11. Creatinine

4.2.12. pH (Body Fluid)

4.2.13. CK, AST, and LD (Cardiac Enzymes), CK-MB and Troponin-I

4.2.14. Cardiac Panel (Inpatient Only)

4.2.15. Ammonia – Note: May require one hour reagent preparation time.

4.2.16. Pregnancy Test (urine or serum)

4.2.17. Drugs of Abuse Screen(urine)

4.2.18. Therapeutic Drug Assays(Acetominophen, Salicylate, Theophyline, Digoxin, Carbemazipine , Gentamicin, Vancomicin, Valproic Acid, Phenytoin, Lithium)
* Note: Lithium and Salicylate may take more than one hour due to reagent preparation time.

4.2.19. Hepatic Panel(TP, Albumin, AST, ALT, Alk Phos, TB)

4.3. HEMATOLOGY:

4.3.1. Complete Blood Count (CBC)

4.3.2. Differential Count - NOTE: A five part automated differential is performed with each CBC request. See Chapter 4, paragraph 3.1.2. for guidance on manual 100 cell differentials.

4.3.3. Platelet Count

4.3.4. Prothrombin Time (PT)

4.3.5. Activated Partial Thromboplastin Time (APTT)

4.3.6. Fibrin Degradation Products (FDP) (collected in special tube provided by the laboratory).

4.3.7. D-Dimer

4.4. MICROBIOLOGY:

4.4.1. Gram Stain

4.4.2. Bacterial Antigen Test (Directogen or Bactogen). This test detects the following:

Streptococcus pneumoniae	Haemophilus influenzae, type b
Streptococcus group B	Neisseria meningitis, groups A, B, C, Y and W135

4.4.3. RSV Test

4.4.4. Influenza Antigen Test

4.5. URINALYSIS: Complete Urinalysis

5. COLLECTION AND SUBMISSION OF SPECIMENS:

5.1. SPECIMEN COLLECTION :

5.1.1. Ward Rounds: Ward rounds are made by laboratory personnel daily at 0600 hours Enter routine electronic inpatient requests for morning rounds by 0500 hours. If a patient is unavailable during a regular laboratory ward round, the laboratory technician will notify the Charge Nurse and will leave the request(s) on the ward. The specimen will be collected on the next scheduled

ward round or by nursing personnel. Specimens drawn on ward rounds will have priority over all routine specimens. Every effort will be made to complete these tests as soon as possible, and no longer than 0800 that day.

5.1.2. Routine Outpatient Tests: Routine outpatient tests are collected and performed from 0730 to 1630 hours, Monday through Friday, except holidays.

5.1.3. Pediatric, Geriatric and Difficult Venipunctures: If the age, physical or mental condition of the patient is such that venipuncture cannot be performed without difficulty, the clinic or ward Charge Nurse is notified and the attending practitioner will be responsible for obtaining the sample(s).

5.1.4. Ambulatory Patients: All ambulatory patients should be sent to the laboratory to have their blood specimens drawn.

5.1.5. Twenty-four Hour Urine: The laboratory will instruct the patients and issue 24-hour urine containers. Since some 24-hour urine procedures require preservatives, send the patient to the laboratory for instructions and the proper containers.

> **NOTE:** Specific instructions for patient preparation and specimen collection handling may be found in the Specimen Collection Guide, Chapter 8 of this Guide or through CHCS, using "Lab Test Information". For special tests not listed in this guide, please call the laboratory (256-7636/7465).

5.2. SUBMISSION OF SPECIMENS:

5.2.1. Specimens CANNOT be collected or accepted WITHOUT a request form or CHCS order from a credentialed provider.

5.2.2. Every specimen must be ordered through CHCS if CHCS access is available to the requesting provider.

5.2.3. Request forms with the following information must accompany every specimen or patient presenting without CHCS data entry and for all Type and Cross, Type and Screen, or Type and Hold Blood Bank Procedures:

> Patient's FULL name; Patient's date of birth; Patient's rank or dependent status; Register number, if applicable (inpatient); Social Security Number with Family Member Prefix; Patient's duty telephone number and home number (if available); Requester’s name; Ward, Clinic, and UCA Code; Specimen source (particularly if a culture or tissue); Time and date specimen obtained; Specific test(s) desired

5.2.4. Appropriate clinical data will be provided on the request forms: Sex (particularly if for Pathology), clinical history and diagnosis (particularly surgical specimens and request(s) for

blood) and antibiotic therapy for microbiology cultures. These are Joint Commission on Accreditation of Healthcare Organizations (JCAHO) requirements.

> **NOTE:** If an unusual microbiology organism is suspected:
> 1. Indicate suspicion on request form
> 2. Phone Microbiology Section because special media could be required. Details of exposure, travel and occupation of patient can be pertinent, and, if so, should be noted on requisition form.

5.2.5. Identify ALL specimens with labels affixed to the samples bearing the patient's full name, register number (if applicable), sponsor's full social security number (including family member prefix), date and time of collection and initials of person collecting the specimen. Clearly identify consecutive samples as to the test and sequence, using NON-SMEARING ink only. Grease pencil markings smear in handling and the laboratory WILL NOT ACCEPT unlabeled or improperly labeled specimens.

5.2.6. Blood and body substance precautions should be consistently used for specimens from all patients. **Blood and body substance specimens MUST be submitted to the laboratory in a zip-loc plastic bag.** Request forms, if submitted, will be attached to the outside of the plastic bag.

5.2.7. Submit specimens in containers which minimize the danger of cross infection. Insure that the specimen container is protected from spillage.

6. REPORTS:

6.1. Laboratory results are entered into CHCS upon completion of testing. Results can be obtained by querying the system through one of the data terminals located throughout the Medical Group.

6.2. DO NOT instruct patients to call the laboratory for ANY results. Laboratory personnel will not release results to patients. Patients who contact the laboratory for results will be referred to the requesting clinic/department or the medical release of information office.

6.3. Group A Beta Strep reports from throats are called or delivered Monday through Friday to the requesting clinic. Beta Strep Group A reports completed on weekends and holidays will be reported to the Emergency Room. Other requests, ordered through the clinics, completed on Friday evening, or at times other than normal duty hours and which have "CRITICAL VALUES" will be reported to the Emergency Room. **NOTE:** Provider is called if any growth is detected in blood cultures.

6.5. Medical-legal specimens are collected, processed and reported in accordance with MGI 41-140, Blood Alcohol Test & Collections of Other Biologic Specimens. Legal blood alcohol tests require the use of Medical Group Form 95. Toxicology requests require the use of DD Form 1323. Sexual assault investigation, slides for motile sperm, require the use of AF Form 52. All forms must be completed in triplicate. ER maintains all material for rape investigation.

7. PROCEDURE TURNAROUND TIME (TAT):

The Medical Laboratory Elements attempt to process all routine test requests during the working shift in which the specimens are received and all STAT procedures within the hour of receipt in the analytical section. Unfortunately, certain procedures must be performed in batches and some procedures involve inherent time limitations that result in lengthy delays. Routine cultures usually require 2 to 3 days to complete, but may take longer if subcultures are needed to isolate the bacteria. Special tests which are shipped out to reference laboratories may require up to 3 to 4 weeks to complete. Anatomic pathology expected TAT's are 4 days for gyn pap smears, 48 hours for most non-gyn cytology and surgical pathology, and 30 days for most final autopsy reports. If non-gyn cytology and surgical pathology specimens cannot be completed in 48 hours, a preliminary report is issued. Provisional autopsy reports are due within 24 hours or next duty day. If more expeditious reporting is required for optimal patient care, please discuss your case with one of our pathologists or laboratory officers. In the event that delays occur in testing, such that we can not meet established turnaround times, providers and affected patient care areas will be notified of the delay and expected time of completion.

CHAPTER 2: HISTOPATHOLOGY

1. DUTY HOURS:

0630 to 1600 hours, Monday through Friday. Personnel are always on-call for emergencies. For customer service call 256-7434.

2. SUBMISSION OF SPECIMENS:

2.1. All specimens should be submitted to Histopathology, Room DX 105, during normal duty hours.

2.2. Specimens collected during non-duty hours may be delivered to the clinical laboratory. The medical laboratory element accepts these specimens for Histopathology as a courtesy service. If the specimens are inadequately submitted, corrections may be required the next duty day before complete processing can be accomplished. If there are any questions about the specimens, the histopathology personnel should be contacted at 256-6789, pager # 4645.

> **NOTE:** For proper handling, collection and preservation of specimens see Anatomic Pathology section of the Specimen Collection Guide.

3. PRIORITY OF SPECIMENS:

3.1. Frozen Section: Frozen sections should be scheduled 24 hours in advance. Unfixed specimens must be hand carried to the laboratory by operating room (OR) personnel and given directly to a Histopathology technician. The specimen must be properly labeled and accompanied by two (2) completed SF 515s with any special instructions(Section 4, Requesting information). Specimens will be immediately examined by a Pathologist. Findings will be directly communicated to the surgeon via telephone and by handwritten report. Malignant breast tumors will be submitted for hormone assays. Please give phone number for report if other than OR. We will attempt reporting to a maximum of two phone numbers. We will remain on hold for a maximum of 60 seconds. The default reporting is the handwritten report which, unless we are instructed otherwise, will be delivered to the OR.

3.2. Rush Cases: Rush cases are to be brought to the attention of a Histology technician. If small enough to be rapidly fixed, specimens will be processed overnight and permanent section will be made available early the following day. Results should be telephoned to the provider no later than (NLT) ll00 hours.

3.3. Special Studies: Requests for immunoflourescence, electron microscopy, cytogenetics, and immunohistochemistry studies should be scheduled with a pathologist at least 24 hours prior to the planned procedure. All special study specimens must be sent immediately on a dampened saline gauze pad. **DO NOT FIX** in formalin!

3.4. Flow Cytometry: Flow cytometry requests at this facility are referred to a reference laboratory. The following instructions must be adhered to for these specimens.

3.4.1. Specimen requirements:

3.4.1.1. Bone Marrow: Please schedule bone marrow collections at least one day in advance, to insure the availability of personnel. Order the test using CHCS and provide appropriate patient history. For collection use Jamshidi Bone Marrow Biopsy & Aspirate Tray, Pharmaseal Corp, Allegiance Healthcare, Cat# BAK4511. A CBC, Retic, and Platelet count should be requested on the day of the bone marrow aspiration, for correlation. Notify the laboratory (256-7434) when the patient has been readied for the test. Although the procedure can be done without pre-medication, we recommend pre-medication for most cases.

3.4.1.2. Blood, bone marrow, and body fluids must be kept at room temperature and received at the reference laboratory within 18 hours of collection. A preliminary diagnosis must be included with the requisition so that the reference laboratory can perform additional markers besides T and B cell markers which are normally included in flow cytometry.

3.4.2. Flow cytometry can not be performed on frozen tissue or fixed tissue. However, T and B cell studies using immunoperoxidase can be performed on these specimens.

3.4.3. Fresh tissue should be kept cold (on wet ice) and moist with saline dampened gauze and delivered to the histopathology section ASAP. It is mandatory to have a clinical history and pre-operative diagnosis when ordering via CHCS.

3.4.4. Samples for flow cytometry must be received in the laboratory no later than 1400 hours to allow for processing and shipment to the reference laboratory same day.

3.5. Routine Cases: All cases submitted from the OR or outpatient clinics by 1500 hours will be processed on the same day and the results of examination normally available in 48 hours. Outside cases will be processed in the same manner as Medical Center cases.

4. REQUEST INFORMATION:

4.1. Submit tissue specimens after order entry has been accomplished in CHCS. For those specimens referred from outside facility, include the following on the SF 515: Patient name; Social security number with Family Member Prefix; Age; Sex; Specimen source; Date of collection; Patient’s clinical history and physical exam findings; Physician’s name and signature; Medical Treatment Facility Identification; Clinic/Ward information.

4.2. All specimens must include pre-operative diagnosis, history and reason for analysis.

4.3. Specimen containers **must** be labeled with the patient's name, FMP/SSN, specimen site and specimen type and collection date.

5. IMPROPERLY SUBMITTED SPECIMENS:

Specimens that do not meet requirements will not be accepted for processing and analysis. Improperly submitted specimens will be returned to the submitting ward, clinic or Operating Suite for correction. Acceptable cases with deficiencies will be cited to the Surgical Case Review Committee. Please note that improper processing of a case and possible permanent degradation

of the specimen may occur when a case is accepted with marginal information. Adverse medicolegal consequences, if any, may then fall to the submitting credentialed provider.

6. POST MORTEM EXAMINATIONS:

The 375th Medical Group policy is to offer an autopsy for any death that occurs in this facility, and for any patient who presents dead on arrival to this facility. The attending provider notes the acceptance or declination in the patient's chart. If an autopsy is pursued, the attending physician (not a nurse or clerk) should call the pathologist to discuss the case and specify any specific clinical questions sought through autopsy. At that discussion, the pathologist should give an estimated time to start dissection and an estimated time when pertinent tissue would be ready for demonstration. A pathologist is available on-call for autopsies. Autopsies will usually be completed within 24 hours of receipt of the remains. The Clinical Laboratory Flight is not responsible for transportation of the remains to and from the morgue except for Medical Examiner cases. Refer to MDI 44-102, Morgue. The body should be properly identified, tagged and wrapped. Bandages, tubes, airways, etc., should be left in place. The Admitting and Disposition (A&D) office will be notified and a SF 523, Authorization for Post Mortem Examination, signed by the legal next of kin (except Medical Examiner cases) and 375th Medical Group/SG authorization must be submitted prior to the start of an autopsy. Personal effects of the deceased will be inventoried by ward or clinic staff and submitted to A&D office prior to transport of remains to the morgue. Under ordinary conditions, interested professional staff are urged to attend autopsies. Other persons may observe an autopsy only with prior permission of the Chief, Anatomic Pathology Element. Preliminary autopsy reports are made available within 24 hours of completion of an autopsy. The final report will be available for filing in the chart within 30 days for routine cases and 90 days for complicated cases.

CHAPTER 3: CYTOLOGY

1. DUTY HOURS:

0730 to 1630 hours, Monday through Friday. Closed weekends and holidays. For Customer Service call 256-7478.

2. SUBMISSION OF SPECIMENS:

2.1. Labeling of Specimens:

2.1.1. Containers: All specimens must be submitted in a properly labeled container which, as a minimum, includes the patient's name and sponsor's social security number (SSN) with family member prefix, and type/source of specimen.

2.1.2. Slides: All slides submitted (including GYN smears, bronchial brush smears, nipple smears, tumor aspirate smears, etc.) must be identified by writing the patient's name and SSN on the frosted end of the slide with a lead pencil or Securline Marker II/Superfrost marker.

2.2. Delivery of specimens:

2.2.1. Duty hours: Specimens will be delivered to the Cytology section. Specimens should be delivered as early in the day as possible to allow for same-day processing.

2.2.2. Non-duty hours: Because of the tendency of non-gyn specimens to rapidly deteriorate, specimen collection during non-duty hours is highly discouraged. If a specimen is collected after normal duty hours, deliver it immediately to the Clinical Laboratory for prompt preservation with Cytolyte Solution.

3. REQUEST FORMS:

3.1. GYN Specimens (PAP smears/Thin Prep): All GYN specimens must be ordered using provider order entry through CHCS and submitted with a contributors list.

3.2.. Non GYN Specimens (All other): All non-GYN specimens must ordered via provider order entry through CHCS.

3.3.. Required Information to be entered in CHCS or on SF 541/ SF 515 for those specimens referred from outside facilities include: Patient name; social security number with Family Member Prefix; Age; Sex; Specimen source; Date of collection; Patient’s clinical history and physical exam findings; For GYN smears, indicate gravida, para, and LMP; Physician’s name and signature; Medical Treatment Facility Identification; Clinic/Ward information.

4. IMPROPERLY SUBMITTED SPECIMENS:

All specimens submitted which are improperly labeled, not labeled or labeled in a different manner

than the contributors' list, CHCS request, or SF 541/515 will not be interpreted until verification and correction by the submitting physician/ward/clinic or medical treatment facility is completed.

5. FEMALE GENITAL SYSTEM:

A large part of the success of gynecological cytology depends upon the quality of the smear/sample. These specimens are submitted with a completed SF 541, Gynecologic Cytology from outside facilities and by provider order entry through CHCS with a contributors list or equivalent for in-house contributors. Cytology smears should never be shipped in same box with specimens in formalin. Fume damage will likely render them unsatisfactory for interpretation.

5.1. Routine pap smear/Thin Prep vial:

5.1.l. Smears should not be taken within two weeks of cauterization, cryotherapy, curettage, or biopsy.

5.1.2. The patient should be instructed not to use a vaginal douche or any vaginal medication or lubricant for at least 24 hours before a smear is to be collected.

5.1.3. No lubricant, except water, should be used for the introduction of the speculum.

5.1.4. The sampling should be done before any pelvic examination.

5.1.5. Full visualization of the cervix and upper part of the vagina is necessary.

5.1.6. For best results, ectocervical and endocervical samples should be obtained and submitted on one slide or collected in one Thin Prep vial.

5.1.7. Write the patient's name and last four digits of the sponsor's social security number in pencil on the frosted end of the glass slide for conventional pap method or on the Thin Prep vial. Do not smudge label with handling.

5.1.8. Keep the spray fixative can ready to spray the smear immediately (**Less Than 2 Seconds!**). Always make sure that the nozzle of the spray can is primed with fixative.

5.1.9. Excess mucous should be removed from the uterine cervix and vagina before the samples are taken.

5.1.10. Ectocervical Sample: Using a plastic Ayre spatula, obtain sample from the ectocervix. Rotate and scrape the external os over its entire circumference. Gather this material into a small area at one end of the slide. For Thin Prep, rinse the spatula by stirring vigorously into the preservative solution at least 10 times.

5.1.11. Endocervical Sample: The endocervical sample must be taken promptly and do not allow the ectocervical sample to air dry. Using a Cytobrush, obtain a second sample from the endocervix. Rotate within the endocervical canal slowly ¼ or ½ turn in one direction. Cytobrush should not be used on pregnant patients.

5.1.12. Sample Preparation for conventional pap method: Mix ectocervical and endocervical samples together with the cytobrush and then roll cytobrush across the entire slide excluding the frosted end creating thin and even smear. Fix immediately by spraying the fixative evenly over the entire smear. Excess fixative does not harm the cellular material. For Thin Prep samples, rinse the brush as quickly as possible in preservative solution at least 10 times while pushing against the vial walls.

5.1.13. Leave the slide horizontally until it is dry or for Thin Prep, tighten the vial cap past the torque line.

5.1.14. If hormonal evaluation is needed, an additional smear may be obtained by scraping the lateral vaginal wall. This sample must be labeled as "Lateral Vaginal Wall".

5.1.15. In postmenopausal women, a vaginal pool sample may be collected and spread on a separate slide, especially if endometrial pathology is suspected.

5.1.16. The need for prompt collection technique and prompt fixation of the smear cannot be overemphasized. Air drying begins very soon after the ecto/endo cervical smear is prepared and can easily lead to an unsatisfactory specimen.

5.2. Vaginal smear in DES-Exposed patients.

5.2.1. Excess mucous should be carefully removed from the uterine cervix and vagina before the samples are taken.

5.2.2. Collect four vaginal scrapings from the fornix to the lower third of the vaginal wall, anteriorly, posteriorly and laterally. Use a separate tongue blade for each quadrant. Label appropriately.

5.2.3. Prepare and fix the smears promptly as described under the routine pap smear collection technique.

5.2.4. In addition collect routine cervical smear or Thin Prep. This must be done last to avoid contamination of the vaginal smears with endocervical cells.

5.3. Vulvar Smears:

5.3.1. The vulvar lesion may be moistened with normal saline if needed.

5.3.2. Lightly scrape the lesion with end of a glass slide or wooden blade.

5.3.3. Promptly smear over previously labeled glass slide with frosted end.

5.3.4. Fix immediately.

6. NON-GYNECOLOGICAL CYTOLOGY SPECIMENS:

The non-gynecological specimens must be properly collected and preserved for satisfactory evaluation. The cells in a fluid medium must not be permitted to deteriorate. The specimens must be brought to the laboratory without delay. If some delay is anticipated, the sample must be refrigerated. These specimens must not be refrigerated on the wards or clinics for a longer period than absolutely necessary. All specimens are submitted with a completed SF 515, Tissue Examination (outside facility) or provider order entry through CHCS if from an in-house contributor.

6.1. Sputum: The "deep cough" sputum specimens and induced sputum specimens will be collected directly into wide mouth containers with cytology fixative. These containers with fixative are available from the cytology section. Pre-label them with the patient's identification and source of the specimen. The importance of proper instructions to the patients regarding "deep cough" cannot be overemphasized. Patients should also be instructed to rinse his mouth with water prior to coughing and expectorating into the specimen container. Early morning sputum specimens on three successive days are recommended. If the patient obtains only saliva or has difficulty with collection in some other way, sputum induction might be considered. Please see Respiratory Therapy for assistance with induced sputum collection.

6.2. Bronchial Brushings:

6.2.l. Write the patient's name and last four digits of the sponsor's social security number with a pencil or a Securline Marker II/Superfrost marker on the frosted ends of the slides. Place paper clips on the labeled end of the slides. Avoid smudging the label with handling.

6.2.2 Obtain the specimen. Immediately roll the brush onto the slide and drop the slide into a sterile container, they will be rehydrated in the lab.

6.3. Bronchial Washings:

6.3.1. Collect the specimen without fixative in a "U" tube.

6.3.2. Label the container with patients identification and site of the specimen.

6.3.3. Deliver the specimen to the cytology section without delay during normal duty hours or to the night/weekend clinical laboratory technician on duty.

6.3.4. Note: A post-bronchoscopy sputum collected between 1 to 12 hours after the procedure is desirable.

6.4. Body Cavity Fluids (Pleural, peritoneal and pericardial):

6.4.1. All specimen containers must be properly identified including the source of the specimens.

6.4.2. All specimens must be collected without fixative and delivered to cytology section/clinical laboratory without delay.

6.4.3. The specimens will be collected in sterile leak-proof containers. The 1000ml Empty Evacuated Container, stock # 6515013306239, is recommended.

6.4.4. l000 units Heparin per l00 ml of fluid may be added to the specimen to prevent clotting. Container, heparinization prior to collection is recommended. The above bottle with heparin can be obtained from the pharmacy.

6.4.5. For the providers at Military Treatment Facilities other than Scott AFB: The provider collecting fluids should add 50% (1:1) volume of 50% ethanol to the specimen before shipping.

6.5. Cerebrospinal Fluid:

6.5.1. Label four sterile screw cap test tube with the patient's name and identification, and number the tubes 1 through 4 in the order in which they are filled.

6.5.2. Collect the specimen. Each tube should contain 2-4 ml. CSF. Tube 1 may be contaminated with blood and may have to be discarded by the lab. Tube 2 should contain enough CSF for all clinical tests requested. Tube 3 is reserved for the bacteriologic investigation. Tube 4 is sent for Cytology.

6.5.3. DO NOT ADD ANY FIXATIVE.

6.5.4. Deliver immediately to laboratory after completing provider order entry through CHCS.

6. Urine: It is very important to furnish pertinent clinical history regarding history of stones, urinary instrumentation, topical chemotherapy, etc. Requests should state if specimen is voided, catheterized or from ileal-conduit. The patient should be well hydrated prior to the specimen collection.

6.6.1. Voided urine: Outpatients should bring their properly collected specimen from the urology clinic directly to avoid cellular degeneration of the sample. Mid-day/ mid-stream urine is optimal. First morning and 24 hour urine specimens are not suitable for cytologic examination. The voided urine specimens from the in-patients on the wards must be submitted to cytology section without delay.

6.6.2. Urinary Bladder / Ureter Washings: Collect the specimen in the pre-labeled clean, screw top urine container and deliver to the cytology section without delay.

6.7. Fine Needle Aspiration Specimens: The success of FNA as diagnostic procedure depends upon proper collection and preparation of adequately prepared and fixed smears.

6.7.1. For the providers at the 375th Medical Group: Contact the cytology section to request assistance of cytotechnologist, cytology technician or cytopathologist. This service is provided as on-call basis. A prior notification 30-60 minutes before the procedure is required. While a 24 hour notification is appreciated.

6.7.2. For the providers at MTFs other than at Scott AFB: The provider performing FNA should have an assistant for smear preparation and fixation. Slides should be labeled according to instructions 2.1.2. prior to obtaining specimen. 95% ethanol, or cyto-spray fixatives is used for fixation of the smears. The smears should be thin and evenly spread. Drop the slide with smear immediately into 95% ethanol or spray fixative immediately. It takes 10–15 minutes to adequately fix the smears dropped in ethanol. The slides should be air dried after fixation and prior to packing for shipping. Please call Cytology Section at Scott AFB (DSN 576-7478) if you have any questions. Provider training is available (includes other MTFs).

6.8. Gastrointestinal Tract:

6.8.1. Specimens for cytological examination can be collected from several areas of the gastrointestinal tract. These procedures are less traumatic to the patient than surgical intervention and if done correctly, can be of great diagnostic value. One major problem which can arise is the rapid degeneration of the cells once they are removed from the body. To avoid this, all specimens should be hand carried immediately to the Cytology Laboratory. These procedures should not be scheduled when the Cytology Laboratory is closed. For outside MTFs, call for establishing a procedure at least one week in advance. Brushings prior to washings might be considered for all locations approached endoscopically.

6.8.2. Specimen Collection:

6.8.2.1. Gastrointestinal Washings(esophageal, gastric, duodenal, colonic):

6.8.2.1.1. Place aspirate fluid in container labeled with the patient's name, SSN and site of collection.

6.8.2.1.2. Hand carry specimen immediately to the Cytology Laboratory with proper CHCS provider order entry.

6.8.2.2. Gastrointestinal Brushings(esophageal, gastric, duodenal, colonic):

6.8.2.2.1. Obtain PreservCyt solution from Cytology prior to procedure. Label slide and vial with patient's name, SSN and site of collection.

6.8.2.2.2. Obtain specimens and smear onto slides.

6.8.2.2.3. IMMEDIATELY place slide in 95% ethanol or spray with approved cytology fixative or allow to air dry.

6.8.2.2.4. Rinse the brush in the PreservCyt solution vial, while pushing the brissles against the vial walls.

6.8.2.2.5. Submit slides and vial with CHCS order entry to Cytology Laboratory. Specify which method of slide fixation was used for further processing.

6.9. Mammary Gland:

6.9.1. Breast Secretions:

6.9.1.1. Label several slides with patient's name and SSN. If secretions are collected from both breasts, label slides "left" and "right".

6.9.1.2. Have patient hold open bottle of 95% ethanol below the breast. Air dried specimens may be submitted if obtained in house.

6.9.1.3. Express secretion by gently pressing areola area with thumb and forefinger. If no secretion appears with this gentle compression, DO NOT MANIPULATE FURTHER.

6.9.1.4. Allow secretion to collect on nipple tip.

6.9.1.5. Using nipple tip, quickly spread secretion on lower 2/3 of labeled slide.

6.9.1.6. IMMEDIATELY drop slide in fixative. If air dried method is used, place slides in specimen container; note method of fixation.

6.9.1.7. Submit to Cytology Laboratory with completed CHCS order entry.

6.9.2. Breast Cysts Aspiration:

6.9.2.1. Label container with patient's name, SSN and specimen collection site.

6.9.2.2. Place specimen into container, WITHOUT fixative.

6.9.2.3. Hand carry, IMMEDIATELY, to Cytology Laboratory with CHCS order entry. If collected after normal duty hours, refrigerate.

6.10. Tzank Smear:

6.10.1. Label 2 slides with patients name and SSN using a lead pencil or a Securline Marker II/Superfrost marker.

6.10.2. Lesion is scraped gently with wooden spatula to remove contaminants, discarded.

6.10.3. If lesion is not ulcerated, remove overlying tissue to expose ulceration.

6.10.4. Either, place clean non-frosted end of slide directly over the lesion, pressing firmly to adhere material to the slide; or use clean wooden spatula to scrape the ulcerated area, directly transferring material to slide.

6.10.5. Hand carry specimen with a completed CHCS order entry IMMEDIATELY to the Cytology section for rehydration and processing.

CHAPTER 4: MEDICAL LABORATORY ELEMENT

1. BLOOD BANK:

1.1. Blood Supply: The blood bank at this facility collects, prepares, and stocks red blood cells (RBCs) and fresh frozen plasma (FFP). Whole blood is not stocked. Other components, including platelets and cryoprecipitate, are obtained from the other blood centers. A frozen blood program is not available at the 375th Medical Group.

1.2. Donations:

1.2.1. Autologous: Candidates for autologous donations must be referred to the blood bank by the attending physician. A MDG Form 87, Autologous Donation Consultation, must be completed with the patient's name, SSN, date of birth, the number of RBC units desired, type of surgery and date of surgery; complete history questions also. The patients should be referred to the blood bank as soon as the surgery is scheduled. Patients for autologous donation should be placed on iron supplementation (ferrous sulfate, 325 mg TID) at least one week prior to the first donation. Donations are scheduled IAW guidelines set by the American Association of Blood Banks: a minimum of 72 hours between donations and the last donation at least 10 days prior to the scheduled surgery. The patient must have a hematocrit of at least 33% (HGB of 11.0) to be eligible to donate. All autologous donations are screened for viral markers; HBsAg, HBcAb, Anti-HCV, HIV 1/2, HTLV-I/II, HIV P24 AG.

1.2.2. Directed: Donors may contact the American Red Cross at 314-658-2187. A non-reimbursable fee is required and the physician should ensure the ARC can provide the desired product within the required time frame.

1.2.3. Therapeutic: Therapeutic phlebotomies are performed by appointment during normal duty hours, Monday through Friday, except holidays. Patients requiring therapeutic phlebotomies must be referred by their primary physician via SF 513, Medical Consultation. The SF 513 must be completed with the patient's name, SSN, the diagnosis, amount of blood to be drawn, frequency of phlebotomy, minimum hematocrit/hemoglobin below which the patient should not be phlebotomized (if applicable), and a stop order. A single SF 513 is good for a period of 6 months after which time a new SF 513 will be required. Additionally, a SF 522, Medical Record, Request for Administration of Anesthesia and for Performance of Operations and Other Procedures (informed consent), must be completed by the primary physician at the time of the initial referral. The informed consent will be filed in the blood bank and need only be accomplished once.

1.3. Requests For Blood:

1.3.1. All requests for type and screen, crossmatch, and blood components are made using the Standard Form (SF) 518, Blood or Blood Component Transfusion, submitted in triplicate. A separate SF 518 must be submitted for each unit of blood desired. The Patient Identification

Section of the SF 518 must be completed legibly with the patient's full name, social security number with family member prefix, and ward/location. Use of the patient's hospital identification card is encouraged. Section I of the SF 518 must be completed by the person initiating the form and include the component desired, type of requisition (e.g. type and screen vice type and crossmatch), date requested, date and time required, known transfusion history, pregnancy history of females, requesting physician and diagnosis/operative procedure.

1.3.2. Requests for blood for routine surgical procedures should be submitted to the blood bank prior to 1200 hours the day prior to surgery and prior to 1600 hours on Friday for surgeries scheduled on Monday. Patient samples and completed crossmatches are viable for 3 days from the day the sample is obtained(day of collection is day zero). Other requests should be submitted as needed.

1.3.3. Request Categories:

1.3.3.1 Type and Screen: An ABO group, Rh type, and antibody screen are performed. The patient's sample is held in the blood bank should a crossmatch be required. If blood is required for transfusion, group specific blood can be released immediately with a 99% chance of compatibility. Fully crossmatched blood can be available in approximately 30 minutes once a type and screen request is upgraded to a crossmatch. If a patient has a positive antibody screen, the antibody will be identified and antigen negative blood crossmatched. The type and screen request should be utilized to the fullest extent possible within prudent care guidelines to reduce unnecessary crossmatches and keep the maximum amount of blood available in the general inventory. The Maximum Surgical Blood Ordering Schedule (MSBOS), found at the end of this section, provides guidelines for the ordering of blood for surgery.

1.3.3.2. Type and Crossmatch: An ABO group, Rh type, antibody screen and crossmatch(es) are performed. Units crossmatched will remain available for three days from date specimen was collected. A fresh patient sample will be required for recrossmatching procedures if blood is needed after this time. Blood should be available approximately 45 minutes after the blood bank receives a sample and SF 518s for a routine crossmatch request. Refer to the MSBOS for the appropriate number of crossmatched units associated with specific surgical procedures.

1.3.3.3. Emergency Release of Uncrossmatched Blood: In an emergency situation, when any delay in transfusion may unduly jeopardize the patient, blood may be issued prior to the completion of testing. The requesting physician must sign a statement indicating that the clinical situation is sufficiently urgent to release the product without pre-transfusion testing. Pre-transfusion testing will be initiated immediately after release. No units will be issued unless a blood sample has been collected from the patient. If the unit is found to be incompatible, the physician will be notified immediately.

1.4. Pre-Transfusion Blood Sample:

1.4.1. A blood sample must be obtained from each patient for testing prior to transfusion. The sample must be collected within three days of the scheduled transfusion.

1.4.2. The identification of the patient and the information on the SF 518 must be verified

immediately prior to collection of the sample and must match exactly. Dog tags and bed labels may not be used to identify a patient. The phlebotomist documents this process by signing their payroll signature and the date and time of collection in the appropriate block of Section I of the SF 518.

1.4.3. For every 10 units of blood requested, the specimen requirement is a minimum of 7 ml of blood, collected in a 7 ml plain, red top vacutainer tube or a 5ml EDTA lavender top. Tubes with gel separators are not acceptable. If the patient has a history of a positive antibody screen, a second 7 ml red top tube and a 5 ml lavender top tube of blood should also be collected. Use only glass vacutainer tubes for blood banking procedures.

1.4.4. The Hollister® Ident-A-Blood Recipient Identification System is used to provide a mechanism to positively identify patient, sample, and blood product. It consists of a Blood Tab Label sheet and Ident-A-Blood Recipient Band. The labels and band are pre-numbered and each patient will be assigned one Hollister® number per admission. When additional blood is ordered, the same Hollister® number is used. (Refer to SGSC OI 160B-007 for instructions on the use of the Hollister® system).

1.4.5. The specimen must be labeled with the patient's full name; SSN with family member prefix; date and time collected; and initials of phlebotomist. All specimens should be transported to the laboratory in a biohazard specimen bag. Incorrectly or incompletely labeled specimens will not be accepted. The above information should be annotated on the specimen tube label of the Hollister® Blood Tab sheet and this label affixed to the sample tube.

1.4.6. In an emergency or mass casualty situation where the identification of the patient is not known, a casualty number assigned to that patient may be used in conjunction with the Hollister® identification number. Extreme caution and attention to detail must be taken in such situations to prevent mix-up of specimens.

1.5. Informed Consent: Patients (or a guardian, in the case of a minor) who may require a blood transfusion must be counseled by their physician as to the benefits and risks associated with the transfusion and they must consent to receive a blood transfusion. Informed consent is documented by completing an Air Force Form (AF FM) 1225, Informed Consent for Blood Transfusion, in duplicate. A single informed consent for transfusion is sufficient for an entire hospitalization or treatment course. A separate consent is not required for each unit transfused. A copy of the completed AF FM 1225 must be brought to the blood bank before blood will be issued for transfusion.

1.6. Issue Of Blood: When a crossmatch is completed, the results will be entered into the Composite Health Care System (CHCS). The status can be obtained by querying the system. Blood for transfusion must be prescribed by a physician. The medical record should be annotated as to the reason(s) for transfusion and the actual transfusion order. A 3 X 5 index card annotated with the patient identification information with the Hollister® "R" number on it must be brought to the laboratory when blood is needed for transfusion. Only medical personnel are authorized to

receive blood. All preparations for transfusion should be made prior to obtaining the blood from the blood bank. Infusion must be started within 30 minutes of issue or the blood must be returned to the blood bank. Blood may NOT be stored in uncontrolled refrigerators outside the blood bank.

1.7. Infusion: Refer to MDGI 44-104 for infusion directions.

1.8. Neonatal Transfusion Practices: Neonates are not routinely tranfused at the 375 MDG. For emergency transfusion of blood products to a neonate, the physician should consult the Blood Bank Medical Director or laboratory officer if the Medical Director cannot be reached immediately.

1.9. Transfusion Reactions: Refer to MDGI 44-104 for detailed description of transfusion reactions. Actions to be taken in event of a suspected reaction:

1.9.1. Stop the infusion immediately.

1.9.2. Notify the physician

1.9.3. Keep the IV line open with slow infusion of normal saline.

l.9.4. Perform a clerical check of all forms, labels and patient identification to ensure correct patient received the unit. If an error is detected, immediately check any other patients that may have had a transfusion started.

1.9.5. Check the administration set and associated fluids.

1.9.6. Report the suspected reaction to the blood bank.

l.9.7. Remain with the patient and observe for further reaction symptoms. Prepare for emergency interventions per physician's orders.

1.9.8. Collect the required initial samples and send to the blood bank. Collect ASAP; avoiding hemolysis during collection. Take the patient identification directly from the ID wristband, don't use addressograph or chart. Required specimens are: 2-7 ml plain glass red top (no gel), 2-5 ml glass purple top, and the first voided urine.

1.9.9. Disconnect the unit and send the unit, administration set, and IV solutions to the blood bank.

1.9.10. In the case of mild urticarial reactions, the infusion may be interrupted and a clerical check performed. If clerical check reveals no errors, the patient may be given antihistamines and the infusion continued slowly at the physician's direction.

1.9.11. Complete Section III, Post-Transfusion Data of the SF 518. File original in the patient's chart. Return the second copy to the blood bank with the specimens, unit, and associated IV tubing lines.

1.9.12. Provide required post-transfusion information to Blood Bank for completion of Section II of AF FM 1224, Blood Transfusion Reaction Investigation.

1.9.13. Record all information in the patient's chart.

1.l0. Transfusion Transmitted Disease: Any patients that develop signs or symptoms of viral disease (such as hepatitis or HIV infection) following a transfusion must be reported to the blood bank for follow-up and look-back procedures.

1.11. Maximum Surgical Blood Ordering System (MSBOS): The MSBOS encourages the use of the Type and Screen procedure on a routine basis for those surgical procedures rarely requiring blood. This system establishes the number of units of blood that should be routinely crossmatched for procedure that normally require transfusion. Please contact the Blood Bank OIC or Medical Director for any procedures not listed.

SURGICAL PROCEDURE	NUMBER OF UNITS
GENERAL SURGERY	
- Amputation Above/Below the Knee	T & S
- Cholecystectomy	T & S
- Exploratory Laparotomy	T & S
HERNIA	
- Inguinal	T & S
- Incisional	T & S
- Umbilical	T & S
- Hiatal	T & S
COLON RESECTION	
- Colectomy	2
- Hemicolectomy	2
- Sigmoidectomy	2
- Abdominal-perineal Resection	2
- Small Bowel Segment	1
SPLENECTOMY	1
BREAST BIOPSY	T & S
MASTECTOMY	
- Simple	T & S
- Radical	1
LIVER BIOPSY	T & S
VEIN STRIPING	T & S
COLOSTOMY, GASTROSTOMY	T & S
HEMORRHOIDECTOMY	T & S
PILONIDAL CYST	T & S
CARDIOVASCULAR SURGERY	
- Thoracotomy	2
- Tracheostomy	T & S
OBSTETRIC - GYNECOLOGIC SURGERY	
- Total Abdominal Hysterectomy	T & S
- Total Vaginal Hysterectomy	T & S
- Vaginal Resuspension	T & S
- Ectopic Pregnancy	2
- Laparoscopy & Bilateral Tubal Ligation	T & S
- Dilatation and Curettage	T & S

SURGICAL PROCEDURE	NUMBER OF UNITS
EAR, NOSE AND THROAT SURGERY	
- Caldwell-Luc	T & S
- Laryngectomy	2
- Radial Neck Dissection	2
PLASTIC SURGERY	
- Mammoplasty	T & S
- Thoracoabdominal Flap	T & S
NEUROSURGERY	
- Craniotomy	2
- Herniated Disc	T & S
ORTHOPEDICS	
- Open Reduction	1
- Arthroscopy	T & S
- Total Knee Replacement	T & S
- Total Hip Replacement	4
GENITOURINARY SURGERY	
- Transurethral Resection of Prostate	T & S
- Radical Nephrectomy	2
- Prostatectomy, Suprapubic	2

2. CHEMISTRY SECTION:

Provides routine and special chemistry services for the hospital. Test batteries can be obtained by requesting the appropriate profile(s). Collection instructions are available in CHCS under "LTI" for all tests available in Chemistry.

> **NOTE:** Order profiles only if the majority of the tests included in a special profile are desired. Otherwise order only those tests required. Profiles are offered to simplify your orders. Panels 1 through 6 are performed on serum from one 10 ml SST tube. Panels 7 through 8 require a 7-10 ml SST.

2.1. Panels:

2.1.1. METABOLIC: (Test # 2971)

Glucose	Sodium (Na)	Calcium
Urea Nitrogen	Potassium (K+)	Phosphorous
Creatinine	Chloride (Cl)	Magnesium
	Carbon Dioxide	

(CO2)

2.1.2. HEPATIC: (Test # 2721)

Total Protein	Albumin
Total Bilirubin	ALT (SGPT)
AST (SGOT)	Alkaline Phosphatase

2.1.3. CARDIAC: (Inpatients or ER Patients ONLY) (Test # 2836)

CK CK-MB

2.1.4. LIPID: (Test # 2741)

HDL Cholesterol	LDL (Calculated)
Triglyceride	Cholesterol

NOTE: Please advise patients to fast 10-12 hours before lipid panel is to be drawn. Ensure the patient takes prescribed medications and drinks plenty of water.

2.1.5. IRON: (Test # 2746)

Iron TIBC Ferritin (referral lab)

2.2. Random Glucose, Fasting Glucose, and Glucose Tolerance Testing: The laboratory has standardized glucose testing to eliminate confusion and occasional mistakes caused by the many different procedures currently being requested. Only those glucose tests listed below will be routinely available. Deviations from these standards are possible but will have to be coordinated, in advance, with the Pathologist.

2.2.1. GLUCOSE: Test will be drawn when patient presents, without regard to fasting.

2.2.2. FASTING GLUCOSE: If patient has eaten in the past 12 hours, s/he will be asked to return at a later time after a 12 hour fast.

2.2.3 OB GLUCOSE SCREEN: Pregnant patients will be given 50g glucose solution and drawn one hour later. PATIENTS NEED NOT BE FASTING FOR THIS TEST. (Test #5915)

2.2.4. 3 HOUR GESTATIONAL GLUCOSE TOLERANCE TEST: In accordance with N.I.H. recommendations, patients receive 100g dextrose solution and are drawn at 0, 1, 2 and 3 hours, following three days of 150g carbohydrate diet. (Test #5920)

2.2.5. 5 HOUR GTT FOR HYPOGLYCEMIA: Same procedure as regular GTT, except blood will be drawn for 5 hours. This test should be used infrequently and only for evaluation of hypoglycemic symptoms. The provider must use the word "Hypoglycemia" somewhere on the request or a standard two hour test will be performed. (Test #5910)

2.2.6. 2 HOUR POST PRANDIAL/POST DEXTROSE: Patient will present in a fasting state. Patient will be given 75 grams dextrose solution(glucola) or a diet that will provide 140-160 grams of carbohydrates. A specimen will be drawn 2 hours after ingesting the glucola or meal.

2.2.7. More specific information for all tolerances are available in CHCS under the heading Laboratory Test Information (LTI). All of these tests will be scheduled by the laboratory, and diet information will be given to the patient. The provider need only fill out the request and direct the patient to us. Glucose Tolerance Tests on bed patients are not as valid as those performed on ambulatory patients.

2.3. Lactose Tolerance: Fasting, 60-minute blood specimens are taken after ingesting 50 gms lactose. In children, 2 gm/Kg body weight is administered. A special high-carbohydrate diet is not necessary. Please contact the Laboratory AT LEAST one week in advance to schedule this test. (Test #999)

2.4. D-Xylose Test: Schedule AT LEAST one week in advance to schedule this test through the Client Services Section.

2.5. Urine Chemistries: Obtain special containers for twenty-four hour urine specimens from the laboratory. Since some tests require a preservative and/or special instructions, send outpatients to the laboratory prior to collection.

3. HEMATOLOGY SECTION:

Provides hematology and coagulation testing.

3.1. Hematology Testing:

3.1.1. Differential/Cell Morphology: A five-part automated differential is provided with all CBCs.

3.1.2. Manual 100 cell differentials will be performed in the following cases:

Automated WBC <3 K/uL or >20 K/mL.
Automated differential is flagged by the instrument for review
Whenever specifically requested by the provider
*Note: for WBC counts >50 K/uL, a 200 cell differential is performed. If the WBC count is <1 K/uL, a 50 cell differential is performed and a 25 cell differential is performed on WBC counts <500/uL.

3.1.2.1. Red cell morphology will be reviewed and reported when the RDW is greater than 20, the MCV is less than 75 or greater than 102.

3.1.2.2. Platelet Count: If the automated platelet count is less than 100 K/uL or is flagged by the instrument, the peripheral smear will be screened to verify the count. If the platelet count is <10 K/uL, a manual count will be performed.

3.1.3. Semen Specimens:

3.1.3.1. Semen Analysis. Semen analysis is performed as part of an infertility investigation or

Urology work-up. This test includes a gross and microscopic examination. The gross examination includes volume, color, and viscosity. The microscopic examination includes a sperm count, morphology, and motility. The patient must abstain from sexual activities for three days prior to specimen collection. The sterile container, which is the laboratory provides, must be warmed to body temperature prior to specimen collection. The specimen must be collected directly into the container and be delivered to the lab within 30 minutes of collection. It must be kept at body temperature during transport. Holding the specimen container next to the body will accomplish this. Semen analysis testing is performed Monday and Thursday (except holidays); specimens must be received between **0800-1300 hours.** Patient must visit the Laboratory to schedule an appointment and receive instructions.

3.1.3.2. Post Vasectomy. Post vasectomy specimens are performed as a follow-up to the vasectomy procedure. The specimen will be examined for the presence of sperm. Instruct the patient to pick-up the sterile specimen container from the laboratory **10-12 weeks** after the vasectomy. The patient must abstain from sexual activities for three days prior to specimen collection. The specimen must be collected directly into the container and deliver to the lab within 30 minutes of collection. Post vasectomy specimen testing is performed Monday through Friday (except holidays); specimens must be submitted prior to **1500 hours**. An appointment is not required for this procedure, however the patient should be instructed to visit the laboratory to receive instructions and obtain the proper container.

3.1.4. Body Fluid Cell Counts: With the exception of CSF, body fluids requiring a cell count must be transferred into a evacuated lavender top tube immediately after collection. If fibrin clots are allowed to form, an accurate cell count cannot be obtained.

3.2. Coagulation Testing:

3.2.1. Submit request for coagulation studies using CHCS order entry.

3.2.2. Bleeding Times will not be performed during the 0600 ward rounds.

3.2.3. Blood is collected in sodium citrate anticoagulant (blue top tube) for all coagulation studies except FDP. Samples for FDP analysis are collected into a special tube available in the laboratory. Blood for coagulation studies should be collected following a clean venipuncture where a good flow of blood has been established. Collect anticoagulated tubes last. Tubes must be well mixed after collection. When only collecting blood for coagulation studies, it is advisable to collect a plain red-top tube first to remove any tissue fluids that may be present as a results of the venipuncture. This clearing tube may be discarded. Blood for coagulation studies must be centrifuged ASAP and test performed within four hours of collection or the plasma specimen separated and frozen. DO NOT put coagulation specimens on ice. For patients with heparin locks, ensure lock is flushed out prior to draw. Specimen must be collected from above the lock site. Over or underfilled tubes will be rejected.

4. MICROBIOLOGY:

4.1. The Microbiology section offers a wide range of services including isolation and identification of microorganisms, antimicrobial susceptibility tests and serological procedures.

4.2. Bactec Blood Culture Collections:

4.2.1. Materials:

4.2.1.1. Sterile syringe and needles

4.2.1.2. Alcohol swabs (85% isopropanol)

4.2.1.3. Blood culture bottles:

4.2.1.3.1. Aerobic: Gray/Blue labeled resin bottle.

4.2.1.3.2. Anaerobic: Orange/Gold labeled resin bottle.

4.2.1.3.3. Peds Bottle: Pink labeled bottle.

4.2.1.4. Iodine tincture or Betadine preparations

4.2.2. Notes:

4.2.2.1. NEVER apply Iodine to the rubber septum of the blood culture bottles under any conditions.

4.2.2.2. ONLY clean the septum of the blood culture bottles with 85% isopropanol.

4.2.2.3. Always inoculate the anaerobic (orange/gold resin) blood culture bottle first.

4.2.2.4. After cleaning the venipuncture site with Iodine, reclean the site with isopropanol to remove the iodine before doing the venipuncture.

4.2.3. Procedure:

4.2.3.1. Draw 16 - 20 ml of blood aseptically into a syringe. Use 8 - 10 ml per bottle.

4.2.3.2. Remove the plastic cover of the blood culture bottles and clean the septum with 85% isopropanol. Inoculate first the anaerobic (orange/gold resin) bottle with 8 - 10 ml of blood. Then inoculate the aerobic (gray/blue resin) bottle with 8 -10 ml of blood. Mix by inversion three times.

4.2.3.3. Label both bottles with the patient's full name, hospital number, time and date of collection, and initials of person collecting the sample. Deliver the bottle to Client Services section personnel during the normal duty day or the Laboratory night personnel at other times.

NOTE: Do not place the label over bar code on the Bactec bottle.

4.2.3.4. If less than 5 ml of blood is obtained, inoculate a pediatric bottle (pink resin) ONLY.

4.2.3.5. Children: Inoculate the pediatric Bactec bottle (pink resin)with minimum of 1cc of blood per year of age with maximum of 5cc(1-3 cc is optimal).

4.3. Tests for bacterial antigens in body fluids: Latex agglutination tests are available for detection of bacterial antigens from CSF, urine, and serum. Antigens from the following microorganisms may be identified:

4.3.1. Haemophilus influenzae Type b

4.3.2. Streptococcus pneumoniae

4.3.3. Streptococcus, Group B

4.3.4. Neisseria meningitidis, Groups A, B, C, Y and W135

4.4. Viral Culture Isolation: Collect specimens promptly, preferable within 3 days and not longer than 7 days after onset of illness. Specimens should be refrigerated promptly after collection. Transport media is not required for CSF and urine, but IS REQUIRED for other types of specimens. Holding (transport) media is available in the laboratory and should be used for the following types of specimens: swabs, exudates, cellular scrapings or washings. All specimens for viral cultures are shipped to reference laboratories for processing. Requisition must indicate source of specimen, type of infection, and virus expected.

4.5. Chlamydia trachomatis: Testing for Chlamydia trachomatis is performed by DNA probe(LCX). Specimens consisting of either a non-clean catch urine or a chlamydia swab from urogenital sites may be submitted for evaluation on a routine basis. If using the swab method, absolutely NO blood may be present. A blood-tinged swab will be immediately rejected by the referral lab. For women who are on their menstrual cycle or if there is any other reason a bloody swab will result from using the two swab collection kit, the provider should order a URINE SAMPLE. The urine specimen **must** be from the first part of a voided (NON-CLEAN CATCH) sample and the patient **must not** have voided during the previous hour. For pediatric patients (conjunctival sites), respiratory specimens and rectal swabs, a chlamydia culture and NOT LCX should be requested. This requires different transport media, which is available from laboratory Client Services, 256-7636.

> **NOTE:** It is important to remove cervical mucus prior to collection for optimal detection of Chlamydia trachomatis.

4.6. Routine Cultures: Below is a composite list of cultures routinely performed, to include source, criteria for pathogen identification in non-sterile specimens, normal reports and normal time requirements for cultures.

SOURCE	CRITERIA FOR REPORT	RESULTS REPORTED	EARLIEST TIME
Throat	Cultured as Rule/Out beta Strep Group A	Beta Strep Gp A	24-48 hrs
		No Beta Strep Gp A	48 hrs
Urine	No growth	No growth	24 hrs
	3 kinds of organisms 50,000	Contam., repeat	24 hrs
	2 kinds of organisms <50,000	Mixed flora	24 hrs
	<2 kinds of organisms <50,000	ID on each	24-48 hrs
	<10,000 col/ml (except Urol & Cath)	Neg Culture Less than 10,000 col/ml	24 hrs
	Any growth Urol & Cath	ID, no Suscept	24-48 hrs
	10,000-50,000	ID & Suscept	24-48 hrs
	1 or 2 kinds of organisms 50,000	ID & Suscept	24-48 hrs
Genital	R/O GC smear (MALES ONLY)	ASAP	2 hrs
	R/O GC culture - Plate on Martin-Lewis Media	No growth Neisseria	48-72 hrs
	R/O beta strep, Group B	Growth/no growth	72 hrs
	Routine culture	ID all organisms Suscept if appropriate	72-96 hrs
Sputum & Bronchial Washings	25 Epith cells/low power field (100X)	Oropharyngeal contamination	same day
	Variety of normal flora and 1+ of anything except B-strep Gr.A	Normal flora	48 hrs
	2+ other than normal flora	ID of the 2+	72 hrs
	3+ - 4+ other than normal flora	ID of the 3+ - 4+	72 hrs
	Staph aureus or gram neg bacilli	ID & Suscept	72 hrs
	Haemophilus influenzae	ID & Suscept	72 hrs
	Streptococcus pneumoniae	ID & Suscept to penicillin	72 hrs
	Yeast	Yeast Present-shipped to reference lab if requested	72 hrs
	Moraxella	ID	72 hrs
Abscess Wound	Source is very important information for us! SPECIFY SUPERFICIAL OR DEEP. Provide separate swabs for each:		
	Aerobic culture	No growth	48 hrs
	Anaerobic culture - use anaerobic transport swab or aspirate in sealed syringe	No growth	7 days
CSF	Smear: We call report to Dr. or ward	Smear report	STAT
	Culture	No growth	72 hrs
Blood & Normally Sterile Body Fluids	Blood: We call Dr. or Ward at first positive indication	No growth	5 days

	Other Body Fluids:	No growth	72 hrs
SOURCE	**CRITERIA FOR REPORT**	**RESULTS REPORTED**	**EARLIEST TIME**
Stool	Culture: Use transport medium which is available at lab collection desk. Routine is for Salmonella, Shigella, Campylobacter and E Coli 0157. Need special request for Yersinia or Vibrio. Do not refrigerate and submit ASAP.	Routine report No growth of Salmonella, Shigella, Campylobacter, or E Coli 0157H7.	4 days
	Ova and Parasites: Use transport media of formalin and PVA, available at the lab collection desk.	None seen	1-3 days
	Cryptosporidium Require Separate Request - SHIPPED OUT	None seen	1-3 days
	Pinworm paddles are available from Pediatric Clinic	Negative	24 hrs
	Occult Blood: Use cardboard "slides" available from clinics.	Negative	24 hrs
	Fecal leukocytes. Submit fresh liquid stool.	None seen	24 hrs
	Fecal Fat	Negative	1-3 days
	Reducing Substances	Negative	1-3 days
	Fecal pH	Obtained Value	1-3 days
AFB (TB) Requires separate request slip	SHIPPED OUT	No AFB seen	24 hrs
	Smear Routine- SHIPPED OUT	No AFB seen	24 hrs
	Culture	No growth	2-8 wks
Vaginal	Wet Prep	No Trichomonas or Yeast Seen	1 hour
Fungus	Requires separate request slip, ALWAYS. - SHIPPED OUT	No growth	3-4 wks

NOTES:

(1) When making a smear for gram stain, ROLL SWAB, do not scrub!

(2) If culture arrives after 1600 hours, ADD 24 hours to the report time.

(3) Please contact the Microbiology Section (256-7466) if an unusual organism is suspected. This will insure that the proper transport or culture media is available, and that the specimen is properly handled. Indicate details of the patient's exposure, travel and occupation on the request form.

(4) Send a separate swab for direct smears on all specimens except throats and urine’s.

(5) Sputum Specimens. Specimens containing more than 25 squamous epithelial cells per low power field, in an average of 10 fields, are not cultured. These are reported as "Excessive oropharyngeal Contamination", and the specimen is discarded.

(6) The reading of cultures is usually performed between 0800-1100 and results entered by 1300 hours. Mornings are times of intense effort to get results into the computer. If the result is not in the computer, the culture process is not complete. If you must call about the status of a culture, please hold calls until after 1100 hrs, and then check the computer before calling.
(7) When Fungal and TB cultures and cytology examination are required, a separate specimen must be collected and submitted with a properly completed SF 541. Cytology specimens and requests are to be submitted to the Cytology Department.
(8) Collection instructions. Written instructions are available in the specimen collection guide for the following:
(a) Collection of Microbiology Specimens.
(b) Criteria for rejection of specimens for Microbiological analysis.
(c) For Anaerobic Specimen Collection, please read the instructions provided with the container, available in Microbiology.
(d) Collection of Specimens for Mycobacteria.
(9) For safety reasons, please do not transport syringes with attached needle. Syringe cap may be taped in place, or fluid may be transferred to a sterile vacutainer red-top tube.

4.7. Preliminary Report Schedule:

4.7.1. Blood cultures: reported at 48 hours.

4.7.2. Fungus cultures: Growth reported per reference laboratory protocols.

4.7.3. Anaerobic cultures: reported two times; 48 hours and 5 days.

4.7.4. Sputum culture: if more than 48 hours is required for definitive identification.

4.7.5. Wounds: if more than 48 hours is required for definitive identification.

4.7.6. CSF: 24 and 48 hours.

5. MYCOBACTERIOLOGY AND MYCOLOGY:

5.1. Specimens for Mycobacteria and fungi cultures are potentially hazardous therefore, these materials must be transported in screw capped, leakproof containers.

5.2. Collection of Specimens:

5.2.1. Sputum: Specimen must be collected in a 50 ml sterile, screw capped, plastic centrifuge tube. These containers are available through normal supply channels. The first morning specimen is collected from a deep cough. If the sputum is less than 5 ml and the patient is not raising enough sputum, it should be induced or a gastric specimen obtained. Saliva or nasopharyngeal secretions are not acceptable. Only one sputum specimen need be submitted if fungal and routine culture and sensitivity are requested. For TB Culture, one sputum specimen per day (first

morning preferred), for three consecutive days should be submitted.

5.2.2. Gastric Washing: The entire gastric content is aspirated before breakfast into a 50 ml, sterile, screw capped, plastic centrifuge tube.

5.2.3. Urine: Submit specimen in a sterile container. A clean catch mid-stream sample(first morning preferred) must be collected, unless catheterized.

5.2.4. Body Fluids/Bronchial Washings: All specimens submitted in sterile containers. To prevent pleural, thoracentesis, joint and abdominal fluids from clotting, add a few drops of sterile heparin to the container; mix by inversion. (If body fluids are allowed to clot, they cannot be centrifuged properly thereby reducing the chance of recovering any organism that may be present in small numbers).

5.2.5. Respiratory specimens such as transtracheal aspirate, lung aspirate, or lung biopsy specimens: If these types of specimens are to be submitted for anaerobic culture, the microbiology section should be called and arrangements made **prior** to the procedure. It should be transported directly to microbiology for immediate plating. (If anaerobes are exposed to air for any period of time the chances for recovery are greatly reduced.)

5.2.6. Biopsy and Tissue: Submit in a sterile double container without preservatives. Sterile saline should be used to prevent the specimen from drying out.

5.2.7. Miscellaneous: Contact the laboratory for instructions on collection of specimens not listed above.

5.3. Fungus Cultures: If a culture for Actinomyces or Nocardia is desired, please inform the Microbiology section; special culture techniques are required to isolate these organisms.

5.4. C. Difficile: Stool specimens must be loose and watery. Formed stools will be rejected.

6. SEROLOGY/IMMUNOLOGY:

The serologic procedures available are listed below. In interpreting the results of the listed procedures, titer movement is of greater significance than the result of a single analysis.

6.1. Streptozyme Slide Test:

6.1.1. The Streptozyme slide test is capable of detecting antibodies to the following Group A streptococcal exoenzymes: streptolysin O, streptokinase, hyaluronidase, DNase, and NADase. This test is most useful when used to screen for recent Group A streptococcal infections, including those not associated with pharyngitis.

6.1.2. All positive Streptozyme slide tests routinely have Streptozyme titers performed.

6.1.3. Positive Streptozyme slide tests with low or inconclusive titers associated with a clinical history suggestive of post-streptococcal sequelae may indicate other tests for streptococcal antigens, e.g. anti-DNase-B, anti-hyaluronidase, and others which may be more diagnostic are

needed.

6.2. Autoimmune Antibody Tests:

6.2.1. Specimens submitted for autoimmune antibody testing will be screened for antibodies to Nuclear Antigen(ANA).

6.2.2 All sera positive for Nuclear Antigen will be shipped to reference lab.

6.3. Monospot: The heterophile antibody of infectious mononucleosis is usually detectable by the sixth to tenth day after onset of illness. It is at its highest level during the second to third week and may persist six weeks or longer.

6.4. RPR: The RPR test is used for the detection of reagin which is present in the serum of patients with syphilis and other acute and chronic condition.

6.5. RF: Used to detect rheumatoid factor (anti-IgG) in serum. All positive tests will have a titer performed.

6.6. Rubella Antibody Screen: The screening test will detect levels of rubella antibody greater than 10 International Units. Specimen with levels lower than 10 IU will be sent to a reference lab for quantitation.

7. URINALYSIS:

7.1. Three variations of urinalysis may be requested: macroscopic; complete (macroscopic and microscopic); and complete with culture. If a macroscopic is ordered and blood, protein, nitrite and/or leukocyte esterase is positive, a microscopic analysis will be automatically performed. A culture will also be performed if ordered.

7.2.1. A microscopic is performed when:

7.2.1. Ordered for an inpatient or from the urology clinic, a microscopic is performed irregardless of macroscopic results.

7.2.2. Any of the results for protein, blood, nitrate, and leukocyte esterase is trace or greater.

7.2.3. Greater than 5 WBCs or 5 RBCs or >1+ bacteria will automatically result in a urine culture being performed.

7.2.4. Urine appearance is hazy or cloudy.

7.3. Pregnancy Testing: Qualitative and quantitative HCG pregnancy tests for serum are available.

7.4. If urine specimens cannot be delivered to the laboratory immediately, the specimen must be kept refrigerated until delivery. Time of collection must be annotated on the specimen and request slip.

CHAPTER 5: CRITICAL LABORATORY VALUES

A critical laboratory value is a value at such variance with normal as to represent a state which is life-threatening or may cause irreparable harm unless some action is taken quickly. It is the laboratory's responsibility to communicate these values immediately and accurately to the attending clinician. When a critical value is observed, the value is immediately verified. Then, the result is called to the requesting provider or ward. If the patient is an outpatient and the clinic or provider cannot be reached, the result is reported to the clinical pathologist on call.

TABLE OF CRITICAL VALUES:

TEST		**LOW**	**GREATER THAN**
1. BLOOD BANK			
Unavailability of compatible blood for TXN Hemolytic Transfusion Reaction			
Blood Released in Emergency, found to be incompatible.			
2. CHEMISTRY			
Ammoina		none	40 mmol/L
Bicarbonate		15 mmol/L	40 mmol/L
Bilirubin	neonatal	none	15 mg/dl
Bilirubin, Total		none	15 mg/dL
Calcium		7.0 mg/dl	12.5 mg/dL
Chloride		80 mmol/L	115 mmol/L
Creatinine			1.4 mg.dl Radiology Only
CK		none	540 IU/L
CK-MB		none	5 ng/mL
CK-MB Index		none	2.5
Glucose	adult	40 mg/dl	400 mg/dl
	child < 6years	40 mg/dl	200 mg/dl
Magnesium		1.0 mg/dl	5.0 mg/dl
Phosphorus		1 mg/dl	7 mg/dl
Potassium	adult	2.5 mmol/L	6.5 mmol/L
Sodium	adult	120 mmol/L	155 mmol/L
	child < 6 years	130 mmol/L	155 mmol/L
Troponin		none	2 ng/mL

3. THERAPEUTIC DRUGS			
TEST		**LOW**	**GREATER THAN**
Acetaminophen		none	150 ? g/ml
Carbamazepine		none	15 ? cg/ml
Digoxin		none	2.0 ng/ml
Dilantin (Phenytoin)		none	30 ? g/ml
Gentamycin, Peak		none	12 ? g/ml
Gentamycin, Trough		none	2.0 ? g/ml
Phenobarbital		none	50 ? g/ml
Quinidine		none	6.0 ? g/ml
Salicylate		none	30 mg/dl
Theophyline		none	25 ? g/ml
Valproic Acid		none	120 ? g/ml
Vancomycin, Peak		none	50 ? g/ml
Vancomycin, Trough		none	15 ? g/ml

4. HEMATOLOGY			
Hgb	Newborn-1mo	8 gm/dl	25.0 gm/dl
	1 mo-6 mo	7 gm/dl	22.5 gm/dl
	6 mo-adult	7 gm/dl	20.0 gm/dl
Hct	newborn-1 wk	35%	65.0%
	1 wk-1 mo	25%	65.0%
	1 mo-6 mo	25%	55.0%
	6 mo-6 yr	25%	50.0%
	6 yr-12 yr	25%	55.0%
	12 yr-adult	24%	60.0%
WBC	newborn-1 wk	2.0 K/uL	35.0 K/uL
	1 wk-adult	2.0 K/uL	30.0 K/uL
Platelets		50 K/uL	1000 K/uL
CSF Cell Count			WBC above 5/mm3
Synovial Fluid		None	≥2000 WBC/ cumm

5. COAGULATION		
PTT	None	>99 sec
INR	None	INR >3.5
Fibrinogen	100 mg/dl	700 mg/dl
Bleeding time	None	15 min
D-dimer	none	positive
FDP	none	positive

6. MICROBIOLOGY
Positive Blood Culture
Positive CSF Gram Stain or Culture
Positive CSF bacterial antigens (Directogen or Bactogen)
Positive AFB
Positive enteric pathogen
Positive parasite identification
Positive STD
Positive RSV
Positive C. Difficile

7. URINALYSIS
Presence of Cystine, Tyrosine, Leucine or Cholesterol crystals.
Presence of RBC, WBC or > 5 Granular Casts.
Any black colored urine specimen.
Positive glucose and ketones on same specimen.

CHAPTER 6: REFERENCE RANGES

1. CHEMISTRY

TEST			REFERENCE RANGES
Alanine Aminotransferase (ALT)		Males:	21 - 72 IU/L
		Females:	9 - 52 IU/L
Albumin			3.5 - 5.0 G/dl
Ammonia			9 - 33 mmol/L
Alcohol		Toxic:	50 - 100 mg/dl
		CNS depr:	100 mg/dl
		Fatalities rptd:	400 mg/dl
Alkaline Phosphatase			38 - 126 IU/L
Amylase		Serum:	30 - 110 IU/L
		Urine:	32 - 641 IU/L
Aspartate Aminotransferase (AST)		Males: Females:	17 - 59 IU/L 14 - 36 IU/L
Bilirubin, Conjugated		Adults:	0.0 - 0.3 mg/dl
		Neonates:	0.0 - 0.6 mg/dl
Bilirubin, Direct (derived test)			0.0 - 0.4 mg/dl
Bilirubin, Total			0.2 - 1.3 mg/dl
Bilirubin, Unconjugated		Adults:	0.0 - 1.1 mg/dl
		Neonates:	0.6 - 10.5 mg/dl
Calcium	Serum:		8.4 - 10.2 mg/dl
	Urine:	Ca free diet:	5 - 40 mg/day
		Low-average:	50 - 150 mg/day
		Average:	100 - 300 mg/day
Carbon Dioxide (Enzymatic method)			22 - 30 mmol/L
Chloride			98 - 107 mmol/L
Cholesterol		Desirable:	<200 mg/dl
		Borderline:	200 - 239 mg/dl
		High:	>= 240 mg/dl
Creatine Kinase (CK)		Males:	55 - 170 IU/L
		Females:	30 - 135 IU/L
Creatinine	Serum:	Males:	0.8 - 1.5 mg/dl
		Females:	0.7 - 1.2 mg/dl
	Urine	24 hour:	800 - 2800 mg/day
		Clearance:	61 - 166 mL/min
Gamma Glutamyltransferase (GGT)		Males: Females:	15-73 IU/L 12-43 IU/L
Glucose	Serum:	Males:	75 - 110 mg/dl
		Females:	65 - 105 mg/dl

TEST		REFERENCE RANGES	
Glucose:	Urine	24 hour:	<500 mg/day
		Random:	<30mg/dl
	CSF:		40 - 70 mg/dl
HDL Cholesterol			>= 35 mg/dL
Iron		Males:	49 - 181 ug/dL
		Females:	37 - 170 ug/dL
Lactate Dehydrogenase (LDH)			313 - 618 IU/L
Lactic Acid			0.7 - 2.1 mmol/L
Lipase			23 - 300 IU/L
Magnesium		Urine: Serum:	73.0-122 mg/day 1.6 - 2.3 mg/dL
Neonatal Bilirubin			1.0 - 10.5 mg/dL
Phosphorus		Serum: Urine:	2.5 - 4.5 mg/dL 400-1300 mg/day
Potassium		Urine: Serum:	25.0 - 125 mmol/day 3.6 - 5.0 mmol/L
Protein, CSF			12 - 60 mg/dL
Protein, Total (Serum)			6.3 - 8.2 g/dl
Sodium		Urine: Serum:	40-220 mmol/day 137 – 145 mmol/L
Total Iron Binding Capacity			250 - 450 ug/dL
Triglycerides	Normal:		< 150 mg/dL
	Borderline:		150 – 199 mg/dL
	High:		200 - 499 mg/dL
	Very High:		>= 500 mg/dL
Uric Acid	Serum	Males:	3.5 - 8.5 mg/dL
		Females (17-34):	2.5 - 6.2 mg/dL
		Females (35-44):	2.5 - 7.0 mg/dL
		Females (>44):	2.5 - 7.5 mg/dL
	Urine	(24 hour)	250 - 750 mg/day
Urea Nitrogen		Males:	9-20 mg/dL
		Females:	7-17 mg/dL
Urine Protein		24 Hour Urine	42-225 mg/day
		Random	< 12 mg/day

2. SPECIAL CHEMISTRY

TEST				REFERENCE RANGES
CEA		Non-smokers:		0.0 - 3.0 ng/ml
		Smokers:		0.0 - 10.0 ng/ml
CK-MB				0 - 5 ng/ml
G-6-PD				Normal
TSH				0.38 - 4.70 mIU/ml
Free T4 (FT4)				0.71 - 1.85 ng/dl
PSA				0 - 4.0 ng/dl
Total T3				0.45 - 1.37 ng/dl
FSH	Male:			1.0 - 8.0 mIU/ml
	Female:	Menopausal	Mid cycle - Peak	5.0 -22.0 mIU/ml
			Follicular	4.0 - 13.0 mIU/ml
			Luteal	2.0 - 13.0 mIU/ml
			Post menopausal	20.0 - 138.0 mIU/ml
LH	Male:			2.0 - 12.0 mIU/ml
	Female:	Menopausal	Mid cycle - Peak	24.0 - 105.0 mIU/ml
			Follicular	1.0 - 18.0 mIU/ml
			Luteal	0.4 - 20.0 mIU/ml
		Post menopausal		15.0 - 62.0 mIU/ml
Prolactin			Males:	3.41 - 30.96 ng/dl
			Females:	5.32 - 22.2 ng/dl
Troponin-I				0-2 ng/ml

3. TOLERANCE TESTS

Glucose, D-Xylose and Lactose Tolerance Tests: Reference values may be obtained by contacting the Chemistry Department in the Clinical Laboratory.

4. THERAPEUTIC DRUG LEVELS

TEST		THERAPEUTIC RANGE	TOXIC / ALERT LEVEL
Acetaminophen		10 - 25 ? g/ml	150 ? g/ml
Carbamazepine		4 - 10 ? g/ml	15.0 ? g/ml
Digoxin		0.8 - 2.0 ng/ml	2.1 ng/ml
Gentamycin,	Trough	0.0 - 2.0 ? g/ml	2.1 ? g/ml
	Peak	5.0 - 10.0 ? g/ml	12.0 ? g/ml
Lithium		0.6 - 1.2 mmol/L	1.5 mmol/L
Phenobarbital		15.0 - 30.0 ? g/ml	50.0 ? g/ml
Phenytoin		10.0 - 20.0 ? g/ml	30.0 ? g/ml
Salycilate		0 - 20.0 mg/dl	30.0 mg/dl
Theophylline		10.0 - 20.0 ? g/ml	25.0 ? g/ml
Valproic Acid		50.0 - 100.0 ? g/ml	120.0 ? g/ml
Vancomycin	Trough	5.0 - 10.0 ? g/ml	15.0 ? g/ml
	Peak	30 - 40 ? g/ml	50 ? g/ml

5. URINALYSIS

MACROSCOPIC			MICROSCOPIC	
TEST	NORMALS		TEST	NORMALS
pH	5 - 8		Leukocyte Esterase	Negative
Protein	Negative,trace		Urobilinogen	Normal, 0.0 - 1.0
Glucose	Negative		WBC	0 – 4 / hpf
Ketones	Negative		RBC	0 – 2 / hpf
Blood	Negative			

6. IMMUNOLOGY

TEST	REFERENCE RANGES
Antinuclear Antibody (ANA)	Negative
Mono Test	Negative
Rubella	Immune (Greater than 1:10)
Haemophilus Influenzae B	Negative
N Meningitidis Gps A.Y	Non Reactive
Mening Grp B/E.Coli K1	Negative
N Meningitidis Gps C.W-135	Non Reactive
S Pneumoniae	Non Reactive
Group B. Strep Body Fluid	Non Reactive
ANA (Qual)	Negative
Streptozyme (STZ)	Negative
STZ Titer	<100 STZ Units
Rheumatoid Factor (RF)	Negative
RF Titer	<1:20 Normal
RPR	Non Reactive
Influenza A Antigen	Negative

7. HEMATOLOGY

TEST		REFERENCE RANGES	
Body Fluid		RBC COUNT	WBC COUNT
	PLEURAL	0 mm^3	0 - 10 mm^3
	DIALYSATE	0 mm^3	0 - 100 mm^3
	PERICARDIAL	0 mm^3	0 - 1000 mm^3
	PERITONEAL	0 mm^3	0 - 300 mm^3
	SYNOVIAL	0 mm^3	0 - 200 mm^3
Cerebrospinal Fluid (CSF)			
	WBC Count		0 - 5 mm^3
	RBC Count		0 - 1 mm^3

TEST			REFERENCE RANGES
Complete Blood Count			
	WBC	Newborn	5.0 - 30.0 k/uL
		l mo	5.0 - 20.0 k/uL
		6 mo	6.0 - 17.5 k/uL
		l-2 yrs	6.0 - 17.5 k/uL
		Peds	5.0 - 15.5 k/uL
		12 yrs	4.5 - 13.5 k/uL
		Adult	4.0 - 11.0 k/uL

TEST			REFERENCE RANGES	
	RBC		Newborn	3.9 - 6.0 M/?L
			l mo	3.0 - 5.4 M/?l
			6 mo	2.7 - 4.9 M/?l
			2 yrs	3.7 - 5.3 M/?L
			6 yrs	3.9 - 5.3 M/?L
			12 yrs	4.0 - 5.2 M/?L
		Male:	Adult	4.0 - 5.6 M/?L
		Female:	Adult	3.6 - 5.0 M/?L
	HGB		Newborn	14.0 - 22.5 gm/dl
			l mo	10.0 - 18.0 gm/dl
			6 mo	9.0 - 14.0 gm/dl
			2 yrs	10.5 - 13.5 gm/dl
			6 yrs	11.5 - 13.5 gm/dl
			12 yrs	11.5 - 15.5 gm/dl
		Male:	Adult	13.0 - 16.3 gm dl
		Female:	Adult	11.0 - 15.0 gm/dl
	HCT		Newborn	45 - 64%
			l mo	31 - 55%
			6 mo	28 - 42%
			2 yrs	33 - 39%
			6 yrs	34 - 40%
			12 yrs	35 - 45%
		Male:	Adult	40 - 49%
		Female:	Adult	34 - 46%
	MCV		Newborn	88 - 123 fL
			l mo	85 - 123 fL
			6 mo	74 - 115 fL
			2 yrs	70 - 86 fL
			6 yrs	75 - 87 fL
			12 yrs	77 - 95 fL
			Adult	80 - 97 fL
			Newborn	28 - 40 pg
	MCH		l mo	28 - 40 pg
			6 mo	25 – 35 pg
			2 yrs	23 - 31pg
			6 yrs	24 - 30 pg
			12 yrs	25 - 33 pg
			Adult	28 - 33 pg
	MCHC		Newborn	28 - 38 g/dl
			l mo	29 - 37 g/dl
			6 mo	29 - 37 g/dl
			2 yrs	30 - 36 g/dl
			6 yrs	31 - 37 g/dl

TEST			REFERENCE RANGES
	MCHC	12 yrs	31 - 37 g/dl
		Adult	33 –36 g/dl
	RDW (Red Cell Dist Width)		11.0 - 14.9 %
	PLT		l50 - 450 K/?L
	MPV (Mean Platelet Volume)		7.4 - l0.4 fL
Eosinophil Count, Absolute		Newborn <24	200-850 /mm3
		One Year old	50 - 700 /mm3
		Adult (Two-Adult)	50 - 450 /mm3
Eosinophils, Nasal			0 - 5 %
Malaria Smear			Negative
Platelet Count (PLT)		Manual	150,000 - 450,000
Reticulocyte Count		Adults	0.5 - 1.5 %
		Neonates	1.0 - 6.5 %
Sed Rate (Modified Westergren)		<50 yrs	>50 yrs
	Male	0 - 15 mm/hr	0 - 20 mm/hr
	Female	0 - 20 mm/hr	0 - 30 mm/hr
Semen Analysis		Volume	1.5 - 5.0 mL
		Count	60 - 120.0 M/ mL
		Motility	60 - 90 %
		Morphology	=>60 % Normal
		Viscosity	Normal Liquifies
Sickle Cell Screen			Negative

8. COAGULATION TESTS

TEST	REFERENCE RANGES
Bleeding Time	2 - 10 min
Fibrin Degradation (FDP)	< 10 ?g/ml
Fibrinogen *	157-444 mg/dl
Partial Thromboplastin Time (APPT) *	25 - 32 sec
Prothrombin Time (PT) *	10.8 – 12.8 sec
D-Dimer	<250 ng/ml

* May vary with changes in reagent lots. Ranges are updated in CHCS whenever a change in lot number occurs.

CHAPTER 7: CRITERIA FOR REJECTION OF SPECIMENS

1. IDENTIFICATION:

1.1. Discrepancy between patient identification on request form and on specimen container.

1.1.1 Required information: Full Name, social security number and family member prefix. If any other information is missing, i.e., phlebotomist's initials, only last four SSAN instead of full SSAN, date, etc., the person who drew the blood can still be contacted to come and correct the specimen. Personnel submitting samples for testing are responsible for checking to ensure the proper label before they arrive. They are required to hand the samples to laboratory personnel primarily to insure we know it is here. If you have time, you are encouraged to check the sample in with them, however, if they wait with you while you check it and one of the pieces of required information is incorrect, you must confiscate the sample.

1.1.2 If MDG personnel present to the laboratory with a mislabeled/unlabeled specimen, if they have relinquished control to you, you are to confiscate the specimen (segregate in a ziplock baggie labeled with information known, date and time. Store appropriately in the shipping area/refrigerator. Specimens will be discarded after new samples or after 48 hours which ever is first.). Notify the person that the specimen will be discarded and a new specimen will be required. Contact the requesting physician by beeper or phone to explain that the specimen was received mislabeled/unlabeled and a new specimen is required. If the physician can not be reached within 15 minutes for a STAT/ASAP or one hour for all others, contact the Charge Nurse of the requesting location in let him/her know the situation and that a new specimen is required. Do not get caught in the middle if they want to argue. If the physician wants to contact the Pathologist on call or the Flight Commander, to gain an exception to this policy, then politely and with all due respect, provide them with the phone/beeper numbers. Exceptions will only be made in extreme case for which the physician takes full responsibility.

1.1.3 Make similar notifications if it comes to your attention that testing has been completed on a mislabeled sample. The completed results will be invalidated by a comment in CHCS.

1.1.4. Fill out a laboratory variance form each time a mislabeled/unlabeled specimen is submitted or notification of a mislabeled specimen is received.

1.2. No identification on container or tube:

> **ACTION:** Do not process. Resolve with technician performing phlebotomy or notify requester to come to Clinical Laboratory to identify specimen. If unable to positively identify tube/specimen, do not perform test(s) and promptly discard specimen. Recall patient and obtain another specimen.

1.3. Test requested specimen source, type of culture or demographic information not on request

form:

ACTION: Call requester or service for necessary information.

2. SPECIMEN:

2.1. Tube or container: broken, leaking or otherwise contaminating the outer surface.

ACTION: Contact patient and requester and obtain another specimen. Discard rejected specimen as biohazardous waste.

2.2. Hematology:

2.2.1. CBC, Sed Rate, reticulocyte count: Specimen contains clots, collected with wrong anticoagulant, short draw.

ACTION: Contact patient or requester and obtain another specimen. Discard rejected specimen as biohazardous waste.

2.2.2. Body fluid specimens other than CSF NOT received in a lavender top tube.

ACTION: Contact requester and obtain another specimen. Consult pathologist for appropriate action if provider requests testing of clotted specimen.

2.3. Chemistry: If a specimen is received in laboratory which demonstrates gross hemolysis, lipemia or icterus, a notation is made on the report that results of the tests may be invalid due to the condition exhibited. It is left to the provider to determine whether the information is of use or whether another sample is to be collected. In the case of icterus or lipemia, the underlying condition must be cleared before a satisfactory specimen can be obtained.

2.4. Special Chemistry: Specimen received is grossly hemolyzed/lipemic.

ACTION: Request new specimen.

NOTE: Slight hemolysis or lipemia will not usually interfere with EIA procedures. If it is not practical to recollect the specimen, note the specimen condition in CHCS.

2.5. Coagulation

2.5.1. Specimen collected in wrong anticoagulant.

ACTION: Recollect in Sodium Citrate tube (blue top) 3.2% or 3.8% (tube filled adequately).

2.5.2. Plasma is severely hemolyzed or clotted.

ACTION: Results may be inaccurate, recollect specimen.

2.5.3. Specimen arrives in laboratory 4 hours or more after venipuncture or not tested within 4 hours of collection.

ACTION: Specimen not acceptable, recollect specimen.

2.5.4. Tubes inadequately filled. Underfilling of Sodium Citrate tubes can cause a dilutional effect, prolonging PT and PTT values.

ACTION: Specimen must be redrawn. Blood should be at or above the bottom of the blue stripe on the manufacturer's label when the tube is held upright. Anything below this stripe is under filled.

2.5.5. FDP. Blood not collected in special tube provided in kit.

ACTION: Contact lab for special tube. Recollect specimen.

2.6. Clinical Immunology: Specimens received with gross hemolysis or lipemia should not be used.

ACTION: Recollect specimen.

2.7. Blood Bank:

2.7.1. Use of SST tubes (with serum separator) is unacceptable for any Blood Bank specimen.

ACTION: Specimen must be recollected into plain red top. Use lavender top, if available.

2.7.2. Grossly hemolyzed specimens are unacceptable for Blood Bank procedures.

ACTION: Recollect specimen.

2.8. Microbiology

2.8.1. Anaerobic culture request on non-applicable specimen, (e.g., sputum, midstream urine, catheterized urine, vaginal secretions, cervical, prostatic secretions, feces, environmental material, gastric washings, bronchoscopic washings, decubitus ulcer material, throat material, hose material, skin material, mouth material, ileostomy material, colostomy material, fistula.)

ACTION: Call requester and explain anaerobic cultures not performed on these specimens. If requester still insists, refer to a pathologist.

2.8.2. Specimen identified by anatomic site only (e.g. chest, leg, etc.)

ACTION: Request additional information (e.g. abcess, superficial wound, dog bite, etc.)

2.8.3. Anaerobic culture request on swab material not submitted in anaerobic transport tube or bag.

ACTION: Immediately inform requester that collection procedure is unacceptable. Do not perform anaerobic culture unless requester insists it is not feasible to obtain another sample. Add comment in CHCS stating that specimen was not transported anaerobically.

2.8.4. Anaerobic culture request on material in anaerobic transport tube and the oxygen indicator indicates presence of oxygen.

ACTION: Call requester and explain anaerobic cultures not performed on these specimens unless time of collection is less than 1 hour ago. If requester still insists, refer to a pathologist. Add comment in CHCS.

2.8.5. Improperly collected sputum (i.e., saliva) for routine culture.

ACTION: Report as "Excessive Oropharygeal Contamination" and call ward or clinic to request another specimen.

2.8.6. Material received in fixative (e.g., formalin).

ACTION: Notify requester that culture cannot be performed on fixed material. Request new specimen.

2.8.7. Gram-stained smear of material from anus or rectum or vagina for gonococci.

ACTION: Notify clinic/ward these gram stains are not performed due to abundant normal flora.

2.8.8. Dry Swab for culture other than rule out beta-Strep.

ACTION: Notify clinic/ward and determine time of collection. If greater than 1 hour request new specimen. Note "Specimen Unsatisfactory-Dry Swab" in computer and on specimen.

2.8.9. Blood in Bactec bottles with request for cultures for mycobacteria (TB) or viruses.

ACTION: Notify clinic/ward these tests require special collection.

2.8.10. Foley catheter tips.

ACTION: Discard sample. Explain problem of patient colonization to requester.

2.8.11. Twenty-four hour urine or sputum collections for Mycobacteria (TB) or fungi.

ACTION: Notify clinic/ward that 24-hour collections are unacceptable and request three single specimens; first morning collections from three consectuive days.

2.8.12. Urine.

2.8.12.1 Held longer than one hour at room temperature

2.8.12.2 Improper container

2.8.12.3 Leaking container

ACTION: Contact clinic/ward, request new specimen. Annotate in CHCS reason for rejection. Discard as biohazardous waste.

2.8.13. Excess barium or oil in stool specimen for ova and parasites.

ACTION: Report: "Excess barium or oil in stool specimen for ova and parasites. Specimen unsatisfactory." Annotate in CHCS.

2.8.14. Stool cultures submitted in improper preservative (e.g., PVA or formalin) or stool cultures which have been refrigerated.

ACTION: Call clinic/ward and explain improper storage will destroy enteric

pathogens. Request patient obtain containers with the proper preservatives from laboratory for recollection.

2.8.15. Stool for Ova and parasite submitted without PVA and formalin vials.

ACTION: Notify clinic/ward specimens older than 1 hour without preservatives will incur loss of pathogens.

2.8.16. Less than one swab per request. (Example: one swab for bacterial, one swab for mycobacterial (TB), and one swab for fungal cultures).

ACTION: Call clinic/ward to request additional material. If that cannot be obtained, ask requester to state priorities for cultures.

2.8.17. Multiple urine, sputum, and routine throat specimens on the same day from the same source (AFB requests excluded). Process all stool specimens received on children younger than three years for a maximum of three in same day.

ACTION: One specimen should be processed. Notify requester that only one will be processed and have them contact a pathologist if they want others processed. Annotate in CHCS as duplicate sample, with reference to sample number testing was performed on.

2.8.18. RSV – Specimen other than nasal washing received for testing

ACTION: Contact clinic/ward and request a nasal washing specimen. If it cannot be obtained, inform them the sample will be sent to reference lab for viral culture only.

2.8.19. Influenza specimens collected improperly; specimens older than 1 hour or placed in viral media.

ACTION: Notify requester, obtain new specimens. Submit 2 swabs(one foam and one synthetic fiber swab, available from Microbiology) or 2 nasal washing specimens.

2.9. Anatomic Pathology:

2.9.1. Tissue specimens not received in formalin, unless otherwise contraindicated by pathologist or physician to conduct specific tests.

ACTION: Call physician to determine why specimen was received without fixative. Add 10% formalin if indicated after discussion with physician.

2.9.2. Pap smears that are not labeled with pencil on their frosted end with the patient's full name and last four of SSAN.

ACTION: Call requester explaining that the information written in pencil is mandatory. Request that personnel from clinic or requester take thin pap smears back for correction. No pap smear will be sent to or accessioned in Cytocenter Scott until all

information is present and correct on the slide.

2.9.3. Broken pap smear slides.

ACTION: Call requester to pick up slide with correlating SF 541 or mail to outside base. No broken slides will be accessioned at the Scott Cyto center. Broken pap smear slides cannot be stained and must not be shipped to Scott.

3. PATIENT RECALL PROCEDURES:

When patients must be recalled to have a sample recollected the following procedures are followed:

3.1. Laboratory sections responsible for the recollection will enter the appropriate comment into the computer, e.g. specimen lost, specimen broken in centrifuge, QNS (quantity insufficient).

3.2. The laboratory will telephone the patient at least three times a day for two consecutive days. If the patient can't be contacted within that period of time, a copy of the recall form, the initial request slip or CHCS request and a letter will be forwarded to the health care provider.

3.3. If a patient can't be contacted the request will be canceled in the computer. A full explanation will be entered into the computer, e.g. "Laboratory was unable to contact patient for recall."

CHAPTER 8: SPECIMEN COLLECTION GUIDE

1. INTRODUCTION

Distribution: Practitioners, nursing stations, surgery, emergency room, outpatient clinics.

1. This collection guide specifies under each procedure the special preparation of patient if required, timing if indicated, type of collection container to use, specific anticoagulant or preservative, and special handling between time of collection and arrival at laboratory (i.e. refrigeration).

2. Every specimen must be properly labeled to be accepted by the laboratory. Included on label will be patient's last name, first name, full SSAN with FMP, date, time, and collector's initials. A CHCS order or written request, from outside physicians, will accompany all submitted specimens. Appropriate clinical data will be included on request form.

3. Prior to collecting specimen, inpatient identity will be verified by checking the patient's wrist band. Outpatients will be requested to furnish their military ID card. In unusual situations a witness will be requested to verify identification.

4. The laboratory's policy is that phlebotomists will make only two attempts to obtain blood. A second phlebotomist/technician can be requested to perform a third venipuncture, but, if unsuccessful, the request form will be given to charge nurse for collection by provider. Care must be taken not to collect blood in same arm as IV (especially near or above the IV site, as this will markedly dilute the specimen with IV fluid).

2. MICROBIOLOGY SPECIMEN COLLECTION

ANAEROBIC			
SPECIMEN	**CONTAINER**	**TECHNIQUE**	**COMMENTS**
Actinomyces: (anaerobic)	a. Anaerobic transport (Anaerobic container/swab available from laboratory)	Aspirate pus with syringe from sinus tract or abscess; use gauze for sulfur granules (may be seen in dressing).	Fistulating chronic infection often in neck, jaw or upper chest; history of "lumpy jaw"; sometimes abdominal lesions.
	b. Sterile swab with specimen for smears.		

SPECIMEN	CONTAINER	TECHNIQUE	COMMENTS

Body Fluids, secretions, Pus: (anaerobic)	a. Anaerobic container/swab	Decontaminate skin; Aspirate without air; DO NOT leave needle on syringe, cover with plastic sleeve or rubber stopper, or collect in anaerobic container.	Do not refrigerate; immediately transport to lab; indicator in anaerobic transport should be colorless at 30 min. after collection.
	b. Sterile swab with specimen for smears.		
Respiratory Tract: (anaerobic)	a. Anaerobic container/swab	Transtracheal aspirate, pleural or empyema fluid only; 1ml if possible; collected by a physician.	History of aspiration or foul smelling sputum.
	b. Sterile swab with specimen for smears.		
Tissue: (anaerobic)	a. Anaerobic container/swab or immediate delivery to Microbiology Dept. in sterile container	Multiple area cultures indicated for gas gangrene; do not add fluid.	Larger specimens (1 cm) will tolerate short exposure to air; bacilli may not be distributed throughout testing area.

AUTOPSY MATERIAL

SPECIMEN	CONTAINER	TECHNIQUE	COMMENTS
Blood: (autopsy)	Sterile blood culture bottles.	10 ml of right heart blood collected either through skin or chest wall or through unopened heart from right ventricle after removal of sternum; decontaminate skin or sear surface before inserting needle; a block of spleen may be substituted for blood culture.	Best collected before body handled too much or opened; need clinical diagnosis, post-mortem interval, autopsy impression, previous positive culture and infection suspected; autopsy cultures are often contaminated.
Tissue: (anaerobic)	Sterile container.	If possible, submit six cm with one aerosol or other surface; in lab aseptically cut one cm from suspicious area including normal tissue.	Aseptic collection is difficult; Coccidiomycosis and TB are often discovered only at autopsy.

BLOOD

SPECIMEN	CONTAINER	TECHNIQUE	COMMENTS
Peripheral:	Blood culture bottles: Aerobic and Anaerobic bottles with resin	Skin decontamination with Betadine and alcohol; sterile venipuncture; do not draw through catheter or cannula; draw two bottles each time; three samples per 24 hrs., or 4 to 6 in 48 hrs. For resin FUO: no specimen closer than one hour. Do not refrigerate; mark bottle with name, date and time. Use alcohol on top of bottle. DO NOT USE BETADINE ON BOTTLE STOPPER.	Need clinical diagnosis, antibiotic, chemotherapy, and immune status. For critical patients, two collections, 15 minutes apart.
Bone Marrow:	Blood culture bottles, TB and Fungus requires special media.	Sterile precautions. Draw one ml or more; make direct smears; place in blood culture bottle.	Recommended for diagnosis of miliary TB, systemic histoplasmosis and other fungus infections.

BODY FLUIDS

SPECIMEN	CONTAINER	TECHNIQUE	COMMENTS
(Other than blood, urine, CSF)			
Bile:	Sterile container and sterile swab.	Submit several ml aspiration with syringe during surgery, from post-op drainage site, or via nasogastric tube from duodenum; duodenal aspirate is sometimes submitted for special tests (over growth of coliform).	Sample may contain gallstones, which should be examined; first ml from post-op site often contains contaminants; helpful to know if for possible *Salmonella* or *Clostridium* infection.
Hematomas:	Sterile tube or Blood culture bottles.	Skin decontaminated; sterile aspiration (2-5 ml) with syringe.	May clot; when in doubt use sterile anticoagulant, use in unsuspected abscess.

SPECIMEN	CONTAINER	TECHNIQUE	COMMENTS
Synovial Fluid:	a. Submit in sterile tube OR	Same as above	Often proteinacious, may clot; do not add acetic acid or fluid which may precipitate protein; helpful to know if history of trauma, previous surgery or infection. Prefer sterile tube.
	b. 2 aerobic swabs AND		
	c. 1 anaerobic swab or container		
Pericardial Fluid:	Sterile tube or Blood culture bottles.	Same as above	Helpful to note history of TB or previous surgery.
Peritoneal Fluid:	Same as Pericardial Fluid.	Same as above	Same as for joint fluid; specimen may be peritoneal dialysis fluid.
Pleural Fluid:	Same as Synovial Fluid.	Sterile aspiration	
Breast Milk:	Same as Synovial Fluid.	Skin decontamination of nipple; pump for manual expression; several ml; first few may be contaminated.	Often submitted for *Staph aureus* and/or hemolytic *Streptococci*; suspected abscess.
Foley Catheter Tips:	Do not submit	Not recommended	Will be rejected culture invariabley yields overgrowth of skin or fecal flora.
Vascular Cannulae, central venous pressure lines umbilical or intra-venous:	Sterile tube	Decontaminate skin; sever aseptically just inside skin interface. If catheter interface is 2-3" send one segment of 2". If catheteris 8-24", send two segments of 2" (one from skin interface and one from with vessel).	Occasionally are removed because of sepsis or fever that is kept going because of a colonized catheter tip. Yeasts are the most common isolate from hyperalimentation lines; helpful to know if history of infection.

CENTRAL NERVOUS SYSTEM

SPECIMEN	CONTAINER	TECHNIQUE	COMMENTS
Brain Biopsy:	Same as anaerobic cultures.	See tissue.	Suspected cryptococcosis; or herpesneeds coordination with Pathologist.
CSF:	Sterile tube	Sterile lumbar puncture; ventricular or suboccipital tap; several ml, if possible. Do not use tube #1. Last tube collected is preferred.	Tentative clinical diagnostic and/or suspicion needed.
SPECIMEN	**CONTAINER**	**TECHNIQUE**	**COMMENTS**
Meningo myelocele:	Sterile tube	Decontaminate skin; sterile aspiration through the skin; often only one specimen.	Fluid is more frequently contaminated or infected than regular spinal fluid.
Shunt Fluid:	Sterile tube	Skin and Catheter decontamination; sterile aspiration through shunt.	Often contaminated infected with skin flora.

EAR

SPECIMEN	CONTAINER	TECHNIQUE	COMMENTS
Internal:	2 Sterile swabs	Cleanse external canal with mild antiseptic; collect specimen through sterile funnel from ear drum for acute or chronic otitis.	If eardrum is not perforated, specimen should be collected by otolaryngologist or other physician.
External Ear:	2 sterile swabs	Cleanse external canal with mild detergent; obtain specimen from an active margin, preferably including fresh secretion from deeper area.	Surface swabbing might miss streptococcal cellulitis erysipelas.

EYE

SPECIMEN	CONTAINER	TECHNIQUE	COMMENTS
Internal:	Sterile swab OR Media from lab	Surgical technique: label carefully whether left or right eye. May use direct innoculation during surgery.	Since specimen is usually small and obtained under great difficulty, speed in transport and care in handling are very important; history of trauma or post-op infection.

GENITAL TRACT FEMALE			
SPECIMEN	**CONTAINER**	**TECHNIQUE**	**COMMENTS**
Amniotic Fluid:	Sterile tube	Aspirate with syringe	Treat as any other normally sterile body fluid; may contain *N. gonorrhoeae*; important in premature rupture of membrane greater than 24 hours.
Cervix:	a. For *N. gonorrhoeae*, immediate plating on modified T-M media (obtain from lab); streak with a single large "Z" configuration. Deliver to lab within 15 min.	Wipe cervix clean of vaginal secretion and mucus; under direct vision, gently compress cervix with blade of speculum and use a rotating motion with swab. Obtain exudate from endo-cervical glands.	Viability of GC organism in transport medium is less. Note history of venereal disease, pelvic inflammatory disease. If culture purpose is to R/O beta strep, write this on request.
	b. Sterile swab.		
Cul de sac (Culdoncentesis)	a. Anaerobic transport container.	Surgical procedure: aspiration of fluid, secretion through posterior vaginal wall.	Used to help diagnose venereal disease, pelvic inflammatory disease.
	b. Sterile swab.		
	c. If PID-Modified T-M plate, deliver plate to lab within 15 minutes.		
Endometrium:	Same as above.	Prepare as for cervix; if swabs are to be used, insert through a sterile tube sheath.	Likelihood of external contamination is high for cultures obtained through the vagina; note if post partum fever or venereal disease history.
Intrauterine Device:	Sterile container containing entire device plus secretion.	Sterile removal.	Consider anaerobic culture; unusual organisms may be isolated; e.g., Actinomyces, *Torulopsis*, and other yeasts; history of bleeding.

SPECIMEN	CONTAINER	TECHNIQUE	COMMENTS
Products of conception (fetal tissue) placenta, membranes:	a. Sterile container.	Sample suspicious areas of tissue or aspirate if contaminated; use autopsy tissue sampling technique.	Occasionally this type of specimen is expelled into toilet and is grossly contaminated.
	b. 2 sterile swabs		
Urethra:	Modified T-M media preferred for G.C. Streak with a single large "Z" configuration, sterile swab. Deliver to lab within 15 minutes.	Collect an hour or more after urinating; if discharge cannot be obtained, use swab to collect material from about 2 cm inside urethra.	On females, discharge may be stimulated by gently stripping and massaging urethra against pubic symphysis through the vagina. Gram stains for GC on females are very inaccurate (pos or neg), therefore of little value. They are not performed in the lab.
Tubes, Ovaries:	a. Anaerobic transport container	Surgical tissue, aspirates, or swabs.	Consider venereal, fungal anaerobic and AFB Infection.
	b. Sterile swab		
Vagina:	a. Sterile swab	Use speculum without lubricant; swab mucosa high in vaginal canal; or use simple aspiration.	Ulcerations should be checked out for syphillis, soft chancre, or genital herpes. Yeast common. Wet mount is for yeast and *Trichomonas*. "Clue Cells" and role of *Gardnerella vaginalis* are controversial.
	b. Wet mount in saline for *Trichomonas sp.* and fungal elements.		
	c. For GC use cervical specimen		
Vaginal cuff:	a. Anaerobic transport container AND b. Sterile swab	Aspirate	
Vulva (including labia, Bartholin's glands):	a. Anaerobic transport container AND Sterile swab OR 2 sterile swabs.	Do not use alcohol for mucous membranes; skin prep for regular skin sites; collect with swab or aspirate with syringe and needle.	

GENITAL TRACT MALE

SPECIMEN	CONTAINER	TECHNIQUE	COMMENTS
Lymph nodes:	Same as for female genital tract.		
Penile Lesion:	2 swabs	Swab if pus.	
Prostatic Fluid:	Secretion in sterile tube or on swabs.	a digital massage through rectum	Not recommend for GC. Helpful for other cultures.
Urethra:	Secretions, slide and/or swab. If GC suspected, streak Modified T-M media with a single large "Z" configuration. Deliver T-M plate to lab within 15 minutes.	Thin urethrogenital alginate swabs are preferred.	In males the presumptive diagnosis of gonorrhea can often be made from Gram stain. For Herpes, refer to "Virus" Section below.
Pus/Abscess:	See Anaerobic culture, and skin (Deep suppurative lesion).		

INTESTINAL

SPECIMEN	CONTAINER	TECHNIQUE	COMMENTS
Duodenal Contents:	Several ml in sterile tube.	Aspirate through tube.	Examine for bacterial overgrowth of *Salmonella typhi* and certain parasites.

SPECIMEN	CONTAINER	TECHNIQUE	COMMENTS

Feces:	For Gross Apperance: Clean, waxed cardboard container with tight cover or clean transport vial.	One gram on 3 alternate days; if collected in sterile bedpan must not be contaminated with urine, residual soap or disinfectant. Not acceptable if: less than 10 days since barium or bismuth; container is leaking; mixed with urine. Bacteria cultures should not be refrigerated.	Transport to lab immediately. Note travel, food, and suspected etiology. DO NOT submit diaper - most brands contain anti-bacterial additives.
	For Occult Blood: Hemocult Card		
	For Bacteria: Commercial vials Transport Media		
	For Parasites: Commercial vials (one vial is 10% Formalin and one vial is PVA)		
	For Cryptosporidium: 10% Formalin	Cryptosporidium stain	Special stain required - sent to reference lab.
Rectal swab:	Sterile Swab (if possible 3 consecutive days)	Swabs of lesions of rectal wall during proctoscopy	Not useful for detection of non-symptomatic patients
Gastric aspirate, neonate:	Sterile container	Collected by physician	History of ruptured membrane; may visualize and isolate causative agent of septicemia before blood cultures become positive.

RESPIRATORY TRACT

SPECIMEN	CONTAINER	TECHNIQUE	COMMENTS
Throat/ pharynx:	Sterile Swab	Swab area of exudation, membrane formation, or inflammation. Rub tonsillar crypts vigorously.	Do not touch oral mucosa or tongue with swab. Will be cultured for group A Strep only, unless other etiologic agents requested. For N. gonorrhea, submit on T-M plate.
Epiglottis:	Sterile Swab		Do not swab throat in case of acute epiglottis unless prepared for tracheostomy.

Nasal sinuses:	a. Anaerobic transport AND		
	b. 2 sterile swabs.		
Nasopharynx:	Thin wire or flexible swab, pharynx - obtain from laboratory.	Swab is passed through nose gently and into naso stay near septum and floor of nose; rotate and remove	Transport to lab immediately. Note suspected agents such as *Bordetella pertussis*.
Oral Cavity-Mucosal surface of gums & teeth:	Swabs and/or slide	Rinse mouth, scrape, swab for yeast or organisms	Culture for yeast; smear Vincents angina.
Dental abscess:	a. Anaerobic transport container/swab AND	Rinse mouth, prep with dry, sterile gauze; aspirate with needle and syringe.	Predominant pathogens are anaerobes including *Actinomyces* and various *Streptococci*.
	b. Sterile swab for smear.		
Bronchoscopy:	Sterile container	Aspirate through inner chamber of bronchoscope brushing, transbronchial biopsies, bronchial secretions.	Does not give any higher yield of mycobacteria than expectorated sputum.
Lung, aspirate:	Anaerobic transport container/swab.	Performed by physician; skin decontaminated; needle inserted through chest wall, transbronchoscopic needle biopsy or thoractomy.	Invasive procedure; process immediately
Sputum-expectorated:	Sterile container	Patient must cough deeply, best under direct supervision of physician or respiratory therapist, may require ultrasonic nebulization, hydration, physiotherapy or postural drainage.	May be refrigerated overnight; sputum with more than 25 squamous epithelial cells per low power field are not acceptable for culture; if sq. cell cancer diagnosed, notify lab and culture will be performed regardless of cell count.

SPECIMEN	**CONTAINER**	**TECHNIQUE**	**COMMENTS**

Transtracheal aspirate (infralaryngeal aspirate)	Sterile container	Performed by a physician. Skin is cleansed and anesthetized; a 14 gauge needle is inserted through the skin of the neck and the crico-thyroid membrane into the trachea. A small sterile catheter is passed through the needle and exudate aspirated.	Used for pneumonia and TB; process immediately.

SKIN

SPECIMEN	CONTAINER	TECHNIQUE	COMMENTS
Superficial wound:	2 sterile swabs	Clean wound surface with 70% alcohol; swab or aspirate deep areas rather than lesion surface.	Clinical information very helpful. NOTE: Animal bite trauma, duration, travel.
Extensive burns:	Dermal punch biopsy in sterile container.	Clean wound surface with 70% alcohol	For quantitative culture 3-4 mm dermal punch.
Deep suppurative lesion (closed abscess):	Syringe or - Anaerobic transport container OR - 2 swabs	Aspirate directly into syringe.	Note duration & location. See anaerobic cultures.
Fistula, sinus abscess:	Anaerobic container OR 2 swabs	Clean surface, swab or aspirate deeply.	See Actinomycosis
Rash:	2 swabs	Clean surface with 70% alcohol; aspirate directly into syringe; if no fluid, instill small amount of sterile saline and aspirate saline. Transfer from syringe to 2 swabs.	Pus or fluid from periphery. Central area of rash may not yield bacteria.
Umbilicus:	Swab	No cleaning	Used to determine *S. Aureus* colonization.

TISSUE

SPECIMEN	CONTAINER	TECHNIQUE	COMMENTS
Surgical or Biopsy:	Sterile container	Collected by physician; 5 to 10 mm cube or aspirate.	See anaerobes; do not discard leftover tissue; freeze in sterile broth until culture and pathology completed.

URINE

SPECIMEN	CONTAINER	TECHNIQUE	COMMENTS
Clean-void:	Sterile, wide-mouth container: 1 ml if only for culture; at least 12 ml if urinalysis is also ordered.	Clean genital area well; void 20-30 ml; then collect specimen without stopping the stream.	Do not culture 24 hr urine; must be plated within 2 hrs of collection unless refrigerated.
Catheter urine or loop ileal urine:	Sterile container	Disinfect tubing with alcohol; aspirate through tubing with a syringe.	Same as Clean-Void urine.
Bladder urine (suprapubic cystoscopie):	Sterile container	Collected by physician by needle aspiration or cystoscopy.	Same as above.

FUNGUS

SPECIMEN	CONTAINER	TECHNIQUE	COMMENTS
Superficial Fungus:	Sterile closed containers clean paper envelopes or Dermatophyre Agar available from the laboratory.	Clean surface with 70% alcohol; pluck hair and/or scrape skin from periphery of area. Clip or scrape nail.	Specimen from center of area may give negative report. Note type fungus suspected.
Other fungal	Collect the same as for bacterial cultures.		Use separate request form for each (e.g. order fungus on separate slip from TB or routine culture).
KOH Prep:	Sterile cup.	Same as above.	Same as above. Note: All fungus cultures shipped to reference lab.

MYCOBACTERIUM (TB)

SPECIMEN	CONTAINER	TECHNIQUE	COMMENTS
Sterile Body Source:			
- CSF:	Sterile container	Collected by physician	
- Bone Marrow or blood:	Heparin vacutainer tube.	Collected by physician	
Non-Sterile Body Source:			
- Sputum:	Container with screw cap inside plastic bag. Special containers available from laboratory Referral Section.	Early morning sputum. Instruct patient to clean containers' exterior with 70% isopropyl alcohol after expectorating. Rinse hands with alcohol and air dry.	
- Sputum, Acid Fast stain:	Sputum in sterile screw cap container inside plastic bag.	Same as above	Note: All mycobacterium cultures shipped to reference lab.

VIRUS

SPECIMEN	CONTAINER	TECHNIQUE	COMMENTS
Herpes:	Herpes collection tube available from lab Specimen Processing Dept.	Specimen collected by practitioner and sent to lab IMMEDIATELY.	Request on miscellaneous form required with DD 2161; preliminary report 48-72 hours.
Chlamydia:	Chlamydia swabs Different swabs for male and female.	Specimen collected by practitioner and sent to lab IMMEDIATELY.	Submit to lab for EIA procedure. Performed at Reference Lab.
RSV	Nasal washings.	Specimen collected by practitioner and sent to lab IMMEDIATELY.	Submit to lab for EIA procedure. If negative, duplicate specimen sent out for confirmation by culture.
Flu	2 Dacron swabs (available from lab)		Submit to lab for OIA procedure; if negative the duplicate sample will be placed in viral media and sent to reference lab for viral culture.
Other Viruses	Viral Transport required - obtain from Lab.	Same as above.	Body site and suspected virus must be specified.

3. BLOOD COLLECTION

*Note: For Referral tests, see section 4. Referral List for additional info.

TEST	CONTAINER	PERFORMED BY
A1C (GLYCOHEMOGLOBIN)	EDTA	CHEMISTRY
ABO/RH	RED TOP (NO SST)	BLOOD BANK
ACE (ANGIOTENSION COVERTING ENZYME)	SST	REFERRAL
ACETAMINOPHEN	SST	CHEMISTRY
ACETONE (KETONES)	SST	CHEMISTRY
ACETYLCHOLINESTERASE	HEPARIN TUBE	REFERRAL
ACID PHOSPHATASE	SST	REFERRAL
ALBUMIN	SST	CHEMISTRY
ALCOHOL	GRAY for legal - SST for medical (Do not clean collection site with solution containing alcohol)	CHEMISTRY
ALDOLASE	SST	REFERRAL
ALDOSTERONE	SST	REFERRAL
ALKALINE PHOSPHATES	SST	CHEMISTRY
ALPHA FETOPROTEIN	SST	REFERRAL
ALPHA I ANTITRYPSIN	SST	REFERRAL
ALT (SGPT)	SST	CHEMISTRY
AMIKACIN	SST	REFERRAL
AMINOPHYLLENE (THEOPHYLLINE)	SST	SPEC CHEM
AMMONIA	SODIUM HEPARIN ON ICE	CHEMISTRY
AMOEBA SEROLOGY	SST	REFERRAL
AMOXAPINE	RED TOP (NO SST)	REFERRAL
AMYLASE	SST	CHEMISTRY
ANA SCREEN (ANTI NUCLEAR ANTIBODY)	SST	SEROLOGY
ANTI PARIETAL CELL AB	SST	REFERRAL

TEST	CONTAINER	PERFORMED BY
ANTI STREPTOKINASE	SST	REFERRAL
ANTI THYROGLOBULIN ANTIBODY	SST	REFERRAL
ANTI THYROID ANTIBODY	SST	REFERRAL
ANTI TRYPSIN, ALPHA-1	SST	REFERRAL
ANTIBODY ID	RED TOP (NO SST) OR EDTA	BLOOD BANK
ANTIBODY SCREEN	RED TOP (NO SST) OR EDTA	BLOOD BANK
ANTI-COMPLEMENT	SST	REFERRAL
ANTI-DNA	SST	REFERRAL
ANTI-EPIDERMAL	SST	REFERRAL
ANTI-EXTRACTABLE NUCLEAR	SST	REFERRAL
ANTI-HAV	SST	REFERRAL
ANTI-HBSAG	SST	REFERRAL
ANTI-HYALURONIDASE	SST	REFERRAL
ANTI-INSULIN ANTIBODY	SST	REFERRAL
ANTIMITOCHONDRIAL ANTIBODY	SST	REFERRAL
ASCORBIC ACID	SST (TO LABORATORY STAT)	REFERRAL
AST (SGOT)	SST	CHEMISTRY
ATCH	EDTA	REFERRAL
B12 FOLATE	SST	REFERRAL
BARBITUATES	SST	REFERRAL
B-HCG(preg test qual, serum or urine)	SST / RANDOM URINE	SPEC CHEM
B-HCG (BETA HCG, QUANT)	SST	CHEMISTRY
BILIRUBIN	SST OR MICROTAINER	CHEMISTRY
BLASTOMYCES ANTIBODY	SST	REFERRAL
BLOOD CULTURE	Use resin bottles if on antibiotics	MICRO
BUN	SST	CHEMISTRY

TEST	**CONTAINER**	**PERFORMED BY**
C PEPTIDE LEVEL	SST (NO PRESERVATIVE)	REFERRAL
C REACTIVE PROTEIN	SST	REFERRAL
C1 ESTERASE INHIBITOR	SST	REFERRAL
C3, C4 COMPLEMENT	SST	REFERRAL
CALCIUM	SST	CHEMISTRY
CARBAMAZEPINE (TEGRETOL)	SST	SPEC CHEM
CARBON DIOXIDE	SST	CHEMISTRY
CBC	EDTA OR MICROTAINER	HEMATOLOGY
CEA	SST	SPEC CHEM
CERULOPLASMIN	SST	REFERRAL
CH50	15 ML SST FROZEN	REFERRAL
CHEM PANELS	SST	CHEMISTRY
CHLAMYDIA	SWABS	REFERRAL
CHLORIDE	SST	CHEMISTRY
CHOLESTEROL	SST (PT SHOULD BE FASTING)	CHEMISTRY
CHROMOSOME STUDIES	CALL REFERRAL	REFERRAL
CK	SST / HEPARINIZED PLASMA	CHEMISTRY
CK-MB	SST / HEPARINIZED PLASMA	CHEMISTRY
CMV TITER	SST	REFERRAL
COAGULATION STUDIES	CALL HEMATOLOGY ; 256-7636	REFERRAL
COCCIDIOMYCOSES	SST	REFERRAL
COLD AGGLUTININS	SST	REFERRAL
COOMBS, DIRECT (DAT)	EDTA	BLOOD BANK
COOMBS, INDIRECT (SEE ANTIBODY SCREEN)	RED TOP (NO SST) OR EDTA	BLOOD BANK
COPPER	SST	REFERRAL
CORTISOL	SST	REFERRAL
COXSACKIE VIRUS TITER	SST	REFERRAL

TEST	CONTAINER	PERFORMED BY
CROSSMATCH	RED TOP (NO SST) OR EDTA; HOLLISTER REQUIRED	BLOOD BANK
CRYOGLOBULINS	SST	CHEMISTRY
DARVON	SST	REFERRAL
DEHA	SST	REFERRAL
DEPAKENE (VALPROIC ACID)	SST	SPEC CHEM
DESIPRAMINE (NONPRAMIN)	SST	REFERRAL
DIGITALIS	SST	REFERRAL
DIGITOXIN	SST	SPEC CHEM
DIGOXIN	SST	SPEC CHEM
DILANTIN (PHENYTOIN)	SST	SPEC CHEM
DOXEPIN	SST	REFERRAL
DRUG SCREEN	100 MLS URINE	URINALYSIS
D-XYLOSE	SCHEDULE WITH LAB; 256-7636	REFERRAL
EB VIRUS TITER	SST 2 ML SERUM	REFERRAL
ECHO	SST 2 ML SERUM	REFERRAL
ELAVIL	SST	REFERRAL
ELECTROLYTES	SST	CHEMISTRY
ELECTROPHORESES, HGB	EDTA	REFERRAL
ELECTROPHORESIS, PROTEIN	SST	REFERRAL
EOSINOPHIL COUNT	EDTA	HEMATOLOGY
ERYTHROPIETIN	SST	REFERRAL
ESR (SED RATE)	EDTA	HEMATOLOGY
ESTRIOL LEVEL	SST	REFERRAL
ESTROGEN RECEPTOR ASSAY	CALL LAB; 256-7636	REFERRAL
FACTOR ASSAYS	BLUE TOP, CALL 256-7636	REFERRAL
FBS (FASTING BLOOD SUGAR)	SST	CHEMISTRY

TEST	CONTAINER	PERFORMED BY
FDP (FSP) (FIBRIN DEGREGA)	SPECIAL TUBE, CALL 256-7636	HEMATOLOGY
FEBRILE AGGLUTININS	SST	REFERRAL
FERRITIN	SST	CHEMISTRY
FETAL HEMOGLOBIN-KB STAIN (QUANT.)	EDTA	REFERRAL
FETAL SCREEN	EDTA	REFERRAL
FETO PROTEIN	SST	REFERRAL
FIBRINOGEN	NA CITRATE	HEMATOLOGY
FOLATE	SST	REFERRAL
FOLIC ACID, RBC	EDTA AND SST	REFERRAL
FOLIC ACID, WBC	EDTA AND SST	REFERRAL
FREE ERYTHROCYTE PROTOPORPHYRINS	EDTA	REFERRAL
FSH	SST	REFERRAL
FSP	SPECIAL TUBE CALL HEMATOLOGY; 256-7636	REFERRAL
FTA-ABS	SST	REFERRAL
FUNGAL STUDIES, ANTIBODY	SST 2 ML	REFERRAL
G6PD	EDTA	CHEMISTRY
GASTRIN	SST	REFERRAL
GENTAMICIN	SST	SPEC CHEM
GGT	SST	CHEMISTRY
GLUCOSE	SST	CHEMISTRY
GLUCOSE TOLERANCE	GRAY TOP (SCHEDULE W/LAB)	CHEMISTRY
GLYCOHEMOGLOBIN (HGB A1C)	EDTA	REFERRAL
GROWTH HORMONE	SST	REFERRAL
HAI (RUBELLA)	SST	SEROLOGY
HAMS TEST	NA CITRATE, SST, EDTA	REFERRAL
HAPTOGLOBIN	SST	REFERRAL
HBSAG (SEE HEPATITIS)	SST	REFERRAL
HDL	SST	CHEMISTRY

TEST	CONTAINER	PERFORMED BY
HELICOBACTER PYLORI	SST	REFERRAL
HEMOGLOBIN AND HEMATOCRIT	EDTA	HEMATOLOGY
HEMOGLOBIN ELECTROPHORESIS	EDTA	REFERRAL
HEPATITIS	SST	REFERRAL
HERPES CULTURE	GREEN BANDED SWAB	REFERRAL
HEXOKINASE	SPEC. TUBE, (CHECK W/REFERRAL)	REFERRAL
HGB A1C	EDTA	REFERRAL
HISTAMINE	SPECIAL GREY TOP	REFERRAL
HISTOPLASMA ANTIBODY	SST	REFERRAL
HIV	SST	REFERRAL
HLA-B27	YELLOW TOP (CALL REFERRAL)	
HUMAN SOMATOTROPIN	SST	REFERRAL
IMIPRAMINE/DESIPRAMINE	SST	REFERRAL
IMMUNOELECTROPHORESIS (IgG, IgA, IgM)	SST	REFERRAL
INFECTIOUS MONONUCLEOSIS	SST	SEROLOGY
INFLUENZA TITER	SST	REFERRAL
IRON	SST	CHEMISTRY
ISOENZYMES	SST	REFERRAL
LACTIC ACID, CSF	STERILE TUBE	CHEMISTRY
LACTIC ACID, PLASMA	GRAY TOP ON ICE	CHEMISTRY
LANOXIN	SST	SPEC CHEM
LATS (LONG ACTING THYROID)	SST	REFERRAL
LDH	SST	CHEMISTRY
LEAD	HEPARIN	REFERRAL

TEST	CONTAINER	PERFORMED BY
LEGIONELLA TITER	SST	REFERRAL
LEUCINE AMINO PEPTIDASE	SST	REFERRAL
LEUKOCYTE ALKALINE PHOSPHATASE	SST	CHEMISTRY
LFT	SST	CHEMISTRY
LH	SST	CHEMISTRY
LIPASE	SST	CHEMISTRY
LITHIUM	SST	CHEMISTRY
LUPUS PANEL	SST	REFERRAL
LYMPHGRANULOMA VENERUM	SST	REFERRAL
MACROGLOBULIN	SST	REFERRAL
MAGNESIUM	SST	CHEMISTRY
MALARIA	EDTA	HEMATOLOGY
MEASLES ANTIBODY (RUBELLA)	SST	SEROLOGY
METHEMOGLOBIN	GRAY	REFERRAL
MICROSOMAL ANTIBODY	SST	REFERRAL
MITOCHONDRIAL ANTIBODY	SST	REFERRAL
MONOSPOT	SST	SEROLOGY
MUMPS VIRUS TITER	SST	REFERRAL
MYCOPLASMA	SST	REFERRAL
MYOGLOBIN	SST	REFERRAL
NORPACE	SST	REFERRAL
OSMOLALITY (OSMO)	SST OR URINE	CHEMISTRY
OSMOTIC FRAGILITY	HEPARIN	HEMATOLOGY
PEPSINOGEN-2	SST	REFERRAL
PHENOBARBITAL	SST	SPEC CHEM
PHENYTOIN (DILANTIN)	SST	SPEC CHEM
PHOSPHOLIPIDS	SST	REFERRAL
PHOSPHORUS	SST	CHEMISTRY
PLATELETS	EDTA	HEMATOLOGY

TEST	CONTAINER	PERFORMED BY
POTASSIUM	SST	CHEMISTRY
PRA, ERA	CONTACT HISTOPATHOLOGY; 256-7434	REFERRAL
PRENATAL, TYPE & SCREEN	RED TOP (NO SST) OR EDTA	BLOOD BANK
PROCAINAMINE/NAPA	SST	REFERRAL
PROGESTERONE	SST	REFERRAL
PROLACTIN	SST	CHEMISTRY
PRONESTYL	SST	REFERRAL
PROSTATIC ACID PHOSPHATASE	SST	REFERRAL
PROSTATIC SPECIFIC ANTIGEN (PSA)	SST	CHEMISTRY
PROTEIN	SST	CHEMISTRY
PROTEIN ELECTROPHORESIS	SST	REFERRAL
PSEUDOCHOLINESTERASE	HEPARIN	REFERRAL
PT & PTT	NA CITRATE (FULL) (Short draws will be rejected)	HEMATOLOGY
PT (PROTHROMBIN TIME)	NA CITRATE (FULL) (Short draws will be rejected)	HEMATOLOGY
PTH (PATATHYROID HORMONE)	SST	REFERRAL
QUINIDINE LEVEL	SST	REFERRAL
RA FACTOR	SST	SEROLOGY
RABIES	SST	REFERRAL
RAST	SST	REFERRAL
RBC COUNT AND INDICES	EDTA	HEMATOLOGY
RBC FOLATE	EDTA	REFERRAL
RBC MORPHOLOGY	EDTA	HEMATOLOGY
RENIN ACTIVITY	EDTA (PT MUST LIE DOWN)	REFERAL
RETICULOCYTE COUNT	EDTA	HEMATOLOGY
RPR	SST	SEROLOGY

TEST	CONTAINER	PERFORMED BY
RUBELLA	SST	SEROLOGY
SALICYLATE	SST	CHEMISTRY
SEDIMENTATION RATE (ESR)	EDTA	HEMATOLOGY
SEROTONIN	24 HOUR URINE	REFERRAL
SERUM PROTEIN ELECTROPHORESIS	SST	REFERRAL
SICKLE CELL TEST	EDTA	HEMATOLOGY
SODIUM	SST	CHEMISTRY
SOMATOMEDIN C	SST	REFERRAL
STREPTOLYSIN O	SST	REFERRAL
TEGRETOL (CARBAMAZEPINE)	SST	SPEC CHEM
TESTOSTERONE	SST	REFERRAL
THEOPHYLLINE	SST	SPEC CHEM
THYROID FUNCTIONS (TFT)	SST	SPEC CHEM
THYROID STIMULATING HORMONE (TSH)	SST	SPEC CHEM
THYROXINE (FREE T4)	SST	SPEC CHEM
TIBC	SST	CHEMISTRY
TOBRAMYCIN	SST	REFERRAL
TOCAINIDE	SST	REFERRAL
TORCH TITER	15 ML SST	REFERRAL
TOTAL T3	SST	SPEC CHEM
TOXICOLOGY SCREEN	SST & 100 MLS URINE	REFERRAL
TOXOPLASMA ANTIBODIES	SST	REFERRAL
TRICYCLIC ANTIDEPRESSANTS	SST	REFERRAL
TRIGLYCERIDES	SST, 12-14 HR FASTING	CHEMISTRY
TROPONIN	SST / HEPARINIZED PLASMA	CHEMISTRY
TSI (Thyroid Stimulating Immunoglob	SST	REFERRAL
TYLENOL (Acetaminophen)	SST	CHEMISTRY
TYPE AND SCREEN (PREADMIT, LTD)	RED TOP (NO SST) OR EDTA; HOLLISTER REQUIRED	BLOOD BANK

TEST	CONTAINER	PERFORMED BY
URIC ACID	SST	CHEMISTRY
VALPROIC ACID	SST	SPEC CHEM
VANCOMYCIN	SST	SPEC CHEM
VIRAL STUDIES	SST	REFERRAL
VITAMIN A	SST (PROTECT FROM LIGHT)	REFERRAL
VITAMIN B12 AND FOLATE	15 ML SST	REFERRAL
VITAMIN C	SST	REFERRAL
WBC COUNT	EDTA	HEMATOLOGY
WBC FOLATE	EDTA AND SST	REFERRAL
ZINC, PLASMA	HEPARIN (CALL lAB)	REFERRAL
ZINC, SERUM	SST (CALL LAB)	REFERRAL

4. REFERRAL LIST

TEST	*COLLECTION TUBE*	*SECTION*	*REF LAB*	*ALT REF LAB*
ACE (ANGIOTENSION COVERTING ENZYME)	SST	*REFERRAL	NICHOLS 7~10 DAY TAT	NONE
ACETYLCHOLINESTERASE	HEPARIN TUBE	*REFERRAL	NICHOLS 7~10 DAY TAT	NONE
ACID PHOSPHATASE	SST	*REFERRAL	NICHOLS 7~10 DAY TAT	NONE
ALDOLASE	SST	*REFERRAL	FORT SAM (FS) 7~10 DAY TAT	NONE
ALDOSTERONE	SST	*REFERRAL	FORT SAM (FS) 7~10 DAY TAT	NONE
ALPHA FETOPROTEIN	SST	*REFERRAL	(EPI LAB) BROOKS AFB 7~10 DAY TAT	NONE
ALPHA I ANTITRYPSIN	SST	*REFERRAL	(EPI LAB) 7~10 DAY TAT	(BJC) 1 DAY TAT
AMIKACIN	SST	*REFERRAL	NICHOLS 7~10 DAY TAT	(BJC) 1 DAY TAT
AMITRIPTYLINE (ELAVIL)	SST	*REFERRAL	NICHOLS 7~10 DAY TAT	(BJC) 2 DAY TAT
AMOEBA SEROLOGY	SST	*REFERRAL	NICHOLS 7~10 DAY TAT	
AMOXAPINE	RED TOP (NO SST)	*REFERRAL	NICHOLS 7~10 DAY TAT	
ANTI PARIETAL CELL ANTIBODY	SST	*REFERRAL	(EPI LAB) 7~10 DAY TAT	
ANTI SMOOTH MUSCLE ANTIBODY	SST	*REFERRAL	(EPI LAB) 7~10 DAY TAT	(BJC) Wed only
ANTI STREPTOKINASE	SST	*REFERRAL		
ANTI THYROGLOBULIN ANTIBODY	SST	*REFERRAL	NICHOLS 7~10 DAY TAT	
ANTI THYROID ANTIBODY	SST	*REFERRAL	(EPI LAB) 7~10 DAY TAT	

TEST	*COLLECTION TUBE*	*SECTION*	*REF LAB*	*ALT REF LAB*
ANTI TRYPSIN, ALPHA-1	SST	*REFERRAL	(EPI LAB) 7~10 DAY TAT	
ANTI-COMPLEMENT	SST	*REFERRAL	(EPI LAB) BROOKS AFB 7~10 DAY TAT	
ANTI-EPIDERMAL	SST	*REFERRAL	NICHOLS 7~10 DAY TAT	
ANTI-EXTRACTABLE NUCLEAR	SST	*REFERRAL	(EPI LAB) 7~10 DAY TAT	
ANTI-HAV	SST	*REFERRAL	(EPI LAB) 7~10 DAY TAT	(SLU) T & F
ANTI-HBSAG	SST	*REFERRAL	(EPI LAB) 7~10 DAY TAT	(SLU) 1DAY TAT
ANTI-HYALURONIDASE	SST	*REFERRAL		
ANTI-INSULIN ANTIBODY	SST	*REFERRAL	NICHOLS 7~10 DAY TAT	
ANTIMITOCHONDRIAL ANTIBODY	SST	*REFERRAL	(EPI LAB) 7~10 DAY TAT	
ASCORBIC ACID	SST (TO LABORATORY STAT)	*REFERRAL	NICHOLS 7~10 DAY TAT	
ATCH	EDTA	*REFERRAL	(EPI LAB) 7~10 DAY TAT	
B12 FOLATE	SST	*REFERRAL	(EPI LAB) 7~10 DAY TAT	ST E'S, COLLINSVILLE
BARBITUATES	SST	*REFERRAL	IN HOUSE	
BLASTOMYCES ANTIBODY	SST	*REFERRAL	(EPI LAB) 7~10 DAY TAT	
C PEPTIDE LEVEL	SST (NO PRESERVATIVE)	*REFERRAL	NICHOLS 7~10 DAY TAT	
C REACTIVE PROTEIN	SST	*REFERRAL	(EPI LAB) 7~10 DAY TAT	ST E'S, COLLINSVILLE
C1 ESTERASE INHIBITOR	SST	*REFERRAL	NICHOLS 7~10 DAY TAT	
C3, C4 COMPLEMENT	SST	*REFERRAL	(EPI LAB) 7~10 DAY TAT	

TEST	*COLLECTION TUBE*	*SECTION*	*REF LAB*	*ALT REF LAB*
CERULOPLASMIN	SST	*REFERRAL	(EPI LAB) 7~10 DAY TAT	
CH50	15 ML SST FROZEN	*REFERRAL	(EPI LAB) 7~10 DAY TAT	
CHLAMYDIA	SWABS	*REFERRAL	(EPI LAB) 7~10 DAY TAT	(BJC) M-F Probe-Tec swabs only
CHROMOSOME STUDIES	CALL LAB 256-7636	*REFERRAL	KEESLER 30 DAY TAT	
CMV TITER	SST	*REFERRAL	(EPI LAB) 7~10 DAY TAT	ST E'S, COLLINSVILLE
COCCIDIOMYCOSES	SST	*REFERRAL	(EPI LAB) 7~10 DAY TAT	
COLD AGGLUTININS	SST	*REFERRAL	NICHOLS 7~10 DAY TAT	ST E'S, BELLEVILLE
COPPER	SST	*REFERRAL	NICHOLS 7~10 DAY TAT	
CORTISOL	SST	*REFERRAL	WILFORD HALL (WH) 7~10 DAY TAT	ST E'S, COLLINSVILLE
COXSACKIE VIRUS TITER	SST	*REFERRAL	(EPI LAB) 7~10 DAY TAT	
DARVON	SST	*REFERRAL	NICHOLS 7~10 DAY TAT	
DEHA	SST	*REFERRAL	(FS) 7~10 DAY TAT	
DESIPRAMINE (NONPRAMIN)	SST	*REFERRAL	NICHOLS 7~10 DAY TAT	
DIGITALIS	SST	*REFERRAL	NICHOLS 7~10 DAY TAT	
DIGITOXIN	SST	*REFERRAL	NICHOLS 7~10 DAY TAT	
DOXEPIN	SST	*REFERRAL	NICHOLS 7~10 DAY TAT	
D-XYLOSE	SCHEDULE	*REFERRAL	NICHOLS 7~10 DAY TAT	
EB VIRUS TITER	SST 2 ML SERUM	*REFERRAL	(EPI LAB) 7~10 DAY TAT	
ECHO	SST 2 ML SERUM	*REFERRAL	NICHOLS 7~10 DAY TAT	

TEST	*COLLECTION TUBE*	*SECTION*	*REF LAB*	*ALT REF LAB*
ELAVIL	SST	*REFERRAL	NICHOLS 7~10 DAY TAT	
ELECTROPHORESES, HGB	EDTA	*REFERRAL	(EPI LAB) 7~10 DAY TAT	(SLU) M,W, F
ELECTROPHORESIS, PROTEIN	SST	*REFERRAL	(FS) 7~10 DAY TAT	(SLU) M,W, F
ERYTHROPIETIN	SST	*REFERRAL	NICHOLS 7~10 DAY TAT	
ESTRADIOL LEVEL	SST	*REFERRAL	NICHOLS 7~10 DAY TAT	ST E'S, COLLINSVILLE
ESTROGEN RECEPTOR ASSAY	CALL LAB; 256-7636	*REFERRAL	NICHOLS 7~10 DAY TAT	
FEBRILE AGGLUTININS	SST	*REFERRAL	NICHOLS 7~10 DAY TAT	
FERRITIN	SST	*REFERRAL	(EPI LAB) 7~10 DAY TAT	ST E'S, BELLEVILLE
FETAL HEMOGLOBIN-KB STAIN (QUANT.)	EDTA	*REFERRAL	ST E'S, BELLEVILLE	
FETAL SCREEN	EDTA	*REFERRAL	ST E'S, COLLINSVILLE	SAME DAY
FETO PROTEIN	SST	*REFERRAL	(EPI LAB) 7~10 DAY TAT	
FOLATE	SST	*REFERRAL	(EPI LAB) 7~10 DAY TAT	ST E'S, COLLINSVILLE
FOLIC ACID, RBC	EDTA AND SST	*REFERRAL	(EPI LAB) 7~10 DAY TAT	
FOLIC ACID, WBC	EDTA AND SST	*REFERRAL	(EPI LAB) 7~10 DAY TAT	
FREE ERYTHROCYTE PROTOPORPHYRINS	EDTA	*REFERRAL		
FSP	SPECIAL TUBE CALL HEMATOLOGY; 256-7636	*REFERRAL	IN HOUSE	
FTA-ABS	SST	*REFERRAL	(EPI LAB) BROOKS AFB 7~10 DAY TAT	(BJC) M,W,F
FUNGAL STUDIES, ANTIBODY	SST 2 ML	*REFERRAL	(EPI LAB) 7~10 DAY TAT	

TEST	*COLLECTION TUBE*	*SECTION*	*REF LAB*	*ALT REF LAB*
GASTRIN	SST	*REFERRAL	BAMC 7~10 DAY TAT	
GLYCOHEMOGLOBIN (HGB A1C)	EDTA	*REFERRAL	(EPI LAB) 7~10 DAY TAT	ST E'S, 2 DAYS COLLINSVILLE
GROWTH HORMONE	SST	*REFERRAL	NICHOLS 7~10 DAY TAT	
HAMS TEST	NA CITRATE, SST, EDTA	*REFERRAL		ST E'S, BELLEVILLE
HAPTOGLOBIN	SST	*REFERRAL	NICHOLS 7~10 DAY TAT	(SLU) SAME DAY
HBSAG (SEE HEPATITIS)	SST	*REFERRAL	(EPI LAB) 7~10 DAY TAT	(SLU) SAME DAY
HELICOBACTER PYLORI	SST	*REFERRAL		ST E'S, SAME DAY, BELLEVILLE
HEMOGLOBIN ELECTROPHORESIS	EDTA	*REFERRAL	(EPI LAB) 7~10 DAY TAT	
HEPATITIS	SST	*REFERRAL	(EPI LAB) 7~10 DAY TAT	ST E'S, 2 DAYS COLLINSVILLE
HERPES CULTURE	GREEN BANDED SWAB	*REFERRAL	(EPI LAB) 7~10 DAY TAT	(BJC) 1-10 DAYS
HEXOKINASE	SPEC. TUBE, (CHECK W/*REFERRAL)			
HGB A1C	EDTA	*REFERRAL	(EPI LAB) 7~10 DAT TAT	(BJC) M-F
HISTAMINE	SPECIAL GREY TOP	*REFERRAL	NICHOLS 7~10 DAY TAT	
HISTOPLASMA ANTIBODY	SST	*REFERRAL	(EPI LAB) 7~10 DAY TAT	
HIV	SST	*REFERRAL	(EPI LAB) 7~10 DAY TAT	ST E'S, 2 DAYS, COLLINSVILLE
HLA-B27	YELLOW TOP (CALL *REFERRAL)		WILFORD HALL (WH) 7~10 DAY TAT	
HUMAN SOMATOTROPIN	SST	*REFERRAL	NICHOLS 7~10 DAY TAT	
IMIPRAMINE/DESIPRAMINE	SST	*REFERRAL	NICHOLS 7~10 DAY TAT	
IMMUNOELECTROPHORESIS (IgG, IgA, IgM)	SST	*REFERRAL	BAMC 7~10 DAY TAT	ST E'S, 2 DAYS, COLLINSVILLE

TEST	*COLLECTION TUBE*	*SECTION*	*REF LAB*	*ALT REF LAB*
IMMUNOGLOBULINS (IgG, IgA, IgM)	SST	*REFERRAL	(EPI LAB) 7~10 DAY TAT	ST E'S, 2 DAYS, COLLINSVILLE
INFLUENZA TITER	SST	*REFERRAL	QUEST 7~10 DAY TAT	
ISOENZYMES	SST	*REFERRAL	NICHOLS 7~10 DAY TAT	
LATS (LONG ACTING THYROID)	SST	*REFERRAL	NICHOLS 7~10 DAY TAT	
LEAD	HEPARIN	*REFERRAL	BAMC 7~10 DAY TAT	
LEGIONELLA	URINE		NICHOLS 7~10 DAY TAT	
LEGIONELLA TITER	SST	*REFERRAL	(EPI LAB) 7~10 DAY TAT	
LEUCINE AMINO PEPTIDASE	SST	*REFERRAL	NICHOLS 7~10 DAY TAT	
LUPUS PANEL	SST	*REFERRAL	(SLU) 7~10 DAY TAT	
LYMPHGRANULOMA VENERUM	SST	*REFERRAL		
MACROGLOBULIN	SST	*REFERRAL	NICHOLS 7~10 DAY TAT	
METHEMOGLOBIN	GRAY	*REFERRAL	NICHOLS 7~10 DAY TAT	
MICROSOMAL ANTIBODY	SST	*REFERRAL	(EPI LAB)	
MITOCHONDRIAL ANTIBODY	SST	*REFERRAL	(EPI LAB)	
MUMPS VIRUS TITER	SST	*REFERRAL		(BJC) 3 DAYS
MUSOLINE	SST	*REFERRAL		
MYCOPLASMA	SST	*REFERRAL		(BJC) T & TH
MYOGLOBIN	SST	*REFERRAL	NICHOLS	

TEST	*COLLECTION TUBE*	*SECTION*	*REF LAB*	*ALT REF LAB*
NORPACE	SST	*REFERRAL	NICHOLS	
PEPSINOGEN-2	SST	*REFERRAL		
PHENOBARBITAL	SST	*REFERRAL	NICHOLS 7~10 DAY TAT	ST E'S, ASAP, COLLINSVILLE
PHOSPHOLIPIDS	SST	*REFERRAL	NICHOLS	
PRIMIDONE	SST	*REFERRAL	NICHOLS	
PROCAINAMINE/NAPA	SST	*REFERRAL	(EPI LAB)	
PRONESTYL	SST	*REFERRAL	NICHOLS 7~10 DAY TAT	
PROSTATIC ACID PHOSPHATASE	SST	*REFERRAL	NICHOLS	
PROTEIN ELECTROPHORESIS	SST	*REFERRAL	(FS) 7~10 DAY TAT	ST E'S, 2 DAYS, COLLINSVILLE
PSEUDOCHOLINESTERASE	HEPARIN	*REFERRAL	NICHOLS	
PTH (PATATHYROID HORMONE)	SST	*REFERRAL	(FS) 7~10 DAY TAT	
QUINIDINE LEVEL	SST	*REFERRAL	NICHOLS	
RABIES	SST	*REFERRAL	BAMC 7~10 DAY TAT	
RAST	15 ML SST	*REFERRAL	NICHOLS	(BJC) W ED ONLY
RBC FOLATE	EDTA	*REFERRAL		
SEROTONIN	24 HOUR URINE	*REFERRAL	NICHOLS	
SERUM PROTEIN ELECTROPHORESIS	SST	*REFERRAL	(FS) 7~10 DAY TAT	(BJC) M-F 2 DAYS TAT
SOMATOMEDIN C	SST	*REFERRAL	NICHOLS	
TESTOSTERONE	SST	*REFERRAL	(EPI LAB)	ST E'S, COLLINSVILLE

TEST	*COLLECTION TUBE*	*SECTION*	*REF LAB*	*ALT REF LAB*
TESTOSTERONE FREE	SST	*REFERRAL	NICHOLS	
TOCAINIDE	SST	*REFERRAL	NICHOLS 7~10 DAY TAT	
TORCH TITER	15 ML SST	*REFERRAL	(EPI LAB)	
TOXICOLOGY SCREEN	SST & 100 MLS URINE	*REFERRAL	(EPI LAB)	
TOXOPLASMA ANTIBODIES	SST	*REFERRAL		(BJC) M,W,F
TRICYCLIC ANTIDEPRESSANTS	SST	*REFERRAL	NICHOLS 7~10 DAY TAT	
TSI (Thyroid Stimulating Immunoglob	SST	*REFERRAL	NICHOLS	
VIRAL STUDIES	SST	*REFERRAL	(W H) 7~10 DAY TAT	(BJC) M,W,F
VITAMIN A	SST (PROTECT FROM LIGHT)	*REFERRAL	NICHOLS 7~10 DAY TAT	
VITAMIN B12 AND FOLATE	15 ML SST	*REFERRAL	(EPI LAB)	ST E'S, COLLINSVILLE
VITAMIN C	SST	*REFERRAL	NICHOLS 7~10 DAY TAT	
WBC FOLATE	EDTA AND SST	*REFERRAL	(EPI LAB) BROOKS AFB 7~10 DAY TAT	
ZINC, PLASMA	HEPARIN (CALL LAB)	*REFERRAL	(FS) 7~10 DAY TAT	
ZINC, SERUM	SST (CALL LAB)	*REFERRAL	(FS) 7~10 DAY TAT	

5. ANATOMIC PATHOLOGY COLLECTION

HISTOPATHOLOGY

SPECIMEN	PROCEDURE	CONTAINER	PRESERVATIVE AND AMOUNT NEEDED	SPECIAL COMMENTS
1. Small tissue	Routine studies	Tight sealing screw cap	10% Neutral Buffered Formalin/amt 10 times volume of tissue.	Formalin is a carcinogen, all containers must be tightly sealed to prevent skin and respiratory contamination.
2. Large tissues		Tight sealing container, snap on or screw cap	* 10% Neutral Buffered Formalin enough to completely cover tissue.	See above precautions. Due to size of tissues and amount of preservative placed in them, please deliver to the tissue lab ASAP after removal so tissues can be sectioned for more adequate preservation.
Routine studies Preferably delivered to Path ASAP with fixative. (For ASAPs after duty hours, contact Pathologist on-call.)				
3. Any tissue	Frozen section Electron micros copy Estrogen/Progest erone assays Immunofluoresce nce cytogenetics	Tight sealing container	No preservative, submit fresh in saline damp gauze.	Notify histopathology at least 24 hours in advance of procedure & again immediately of removal of the tissue. Action is required within 15 minutes, or the sample could be inadequate due to deterioration.
4. Limbs from amputations.	Routine or special studies.	Wrapped in plastic shroud, then place in doubled plastic bags. Tie or seal bags tightly.	Refrigerate	Due to nature and size of specimens, preservation in solution is inappropriate. Specimen must be refrigerated & transported to the lab ASAP.

ONLY FOR LARGE LIMB AMPUTATIONS. DIGITS CAN BE SUBMITTED AS SMALL TISSUES.				
5. Specimens submitted for photography.	Routine or special studies	Tightly sealed container	None	Give specimen directly to histo technician. Requesting physician should discuss with pathologist.
FOR ANY QUESTIONS OR ULTRA-SPECIAL CASES, CONTACT HISTOPATHOLOGY AT 256-7434. ON WEEKENDS AND HOLIDAYS CONTACT THE CLINICAL LABORATORY (256-7465). THEY WILL CONTACT THE ON CALL HISTOPATHOLOGY TECHNICIAN/PATHOLOGIST.				

CYTOLOGY

SPECIMEN	PROCEDURE REQUIRED	CONTAINER	PRESERVATIVE/ AMOUNT NEEDED	COMMENTS
1. CSF	a. Routine Cytology. b. For cell count -see Hematology section.	Sterile (tight seal). Sterile (tight seal).	None - submit fresh.None - submit fresh.	Submit immediately. If after normal duty hours take specimen and paperwork to laboratory.
2. Urine	Routine cytology	Sterile (tight seal)	None - submit fresh	24 hour or 1st morning urines are not accepted. NOTE whether voided or catheterized.
3. Bronch Washings/BAL	Routine cytology	Sterile (tight seal) U-tube	None - submit fresh	* See general comments below.
4. Sputum - ordered as series	Routine cytology	Tight sealing	Cytolyt solution (no less than equal part fix. to specimen, 1:1).	Specimens should be collected as 1st morning deep coughs on 3 consecutive days.
5. Sputum - Post bronchoscopy	Routine cytology	Tight sealing	Cytolyt Solution (no less than equal part fix. to specimen, 1:1).	Specimen should be all sputum coughed up starting immediately following bronchoscopy for 24 hrs. It may be necessary to use more than one container.
6. Slides prepared from Endoscopic brushings and fine needle aspirations.	Routine cytology	Tight sealing that will hold slides in upright position.	Air dried.	Mark all slides last name and last 4 of SSN. Place a paper clip on marked end of slide.

7. Other Body Fluids:	Routine cytology	Tight sealing container.	None - submit fresh	Submit IMMEDIATELY to Cytology.
SPECIMEN	**PROCEDURE REQUIRED**	**CONTAINER**	**PRESERVATIVE/ AMOUNT NEEDED**	**COMMENTS**
- Pleural				
- Peritoneal				
- Renal				
- Breast				
- Hydrocele				
8. Pap Smears	Routine cytology	Thin Prep vial or slide box or individualized slide holder.	For slides: IMMEDIATELY Spray with aerosol cytologic fixative. (Available through Medical Supply)	All specimens must be labeled with last name & 4 of SSN with lead pencil, or Securline Marker II/Superfrost marker.
9. Breast Discharge	Routine cytology	Put slides in sterile container.	Air dried.	All slides must be labeled with last name & 4 of SSN with lead pencil, or Securline Marker II/Superfrost marker.
10. Fine Needle Aspirations	Routine cytology	Put air dried slides into sterile container. If assistance is required Cyto tech will handle slides accordingly.	Air dried.	All slides must be labeled with last name & 4 of SSN with lead pencil, or Securline Marker II/Superfrost marker.

6. GENERAL COMMENTS:

1. All specimens for Histopathology/Cytology should be submitted directly to the Histopathology/Cytology Lab between 0730 - 1630 hours.

2. Specimens collected during other than normal duty hours may be delivered to the Clinical Laboratory.

3. Required fixatives may be obtained (although not routinely supplied) from Anatomic Pathology between 0730 - 1630 hours, Monday through Friday.

4. If assistance is required on Fine Needle Aspirations, Cytology must be notified at least 30-60 minutes prior to procedure. The section processes literally hundreds of specimens daily and may sometimes be in the middle of procedures, which CANNOT be interrupted due to the nature of specimen(s). Therefore, if you require assistance you may be required to delay your procedure for up to one hour and, on rare occasions, it may be necessary to reschedule procedure.

5. Histopathology/Cytology personnel will make every effort possible to offer any assistance they are capable of. Please be patient if there are any delays.

6. If you have any questions, feel free to call Histology at 256-7434 or Cytology at 256-7478. If you need assistance with a surgical or tissue specimen on a weekend or holiday, contact the Clinical Laboratory (256-7465) and they will either contact or put you in touch with the Histopathology technician on call.

COMMANDER'S APPROVAL

Reviewed/Approved:

//signed//
ANGELICA BLACK, 1Lt, USAF, BSC
Chief, Medical Laboratory

Reviewed/Approved:

//signed//
JAMES SANDERSON, Maj, USAF, MC
Medical Director

Reviewed/Approved:

//signed//
KIRBY R. HOLMES, Lt Col, USAF, BSC
Pathology Flight Commander

Reviewed by:_____Date:_____

Reviewed by:_____Date:_____

Reviewed by:_____Date:_____

1 Attachment, Pathology Flight Organizational Charts